pit and quarry

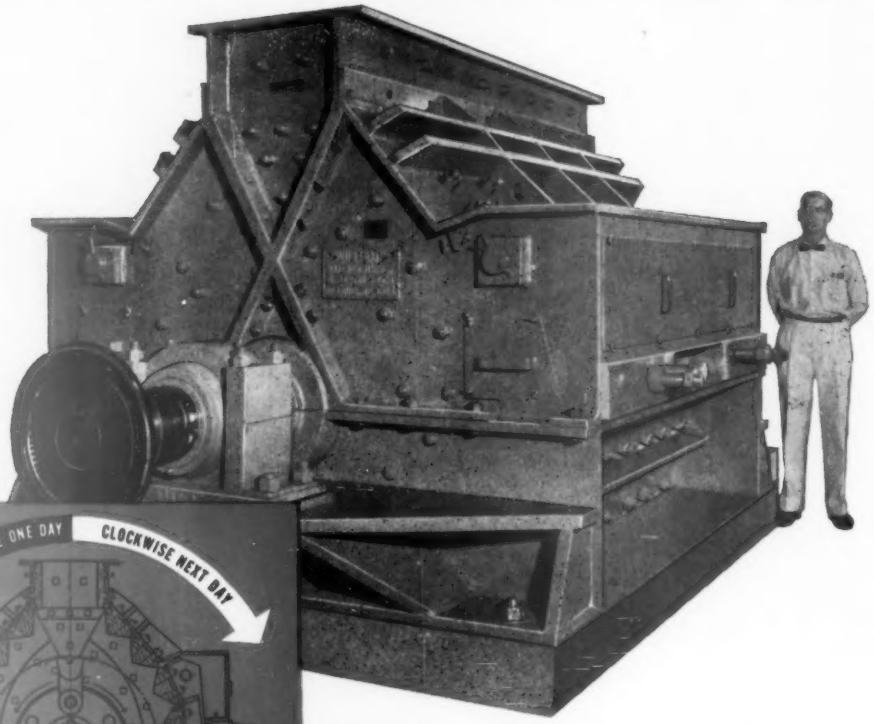
THE BASIC MAGAZINE IN A BASIC INDUSTRY

november
1960

Aggregate Conveyor Bridge for Ice Harbor Dam

See Page 85

More efficient CRUSHING AT LOWEST COST for labor, power and upkeep with WILLIAMS REVERSIBLE IMPACTOR



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CRUSHERS GRINDERS SHREDDERS
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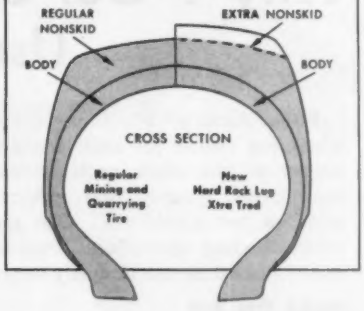

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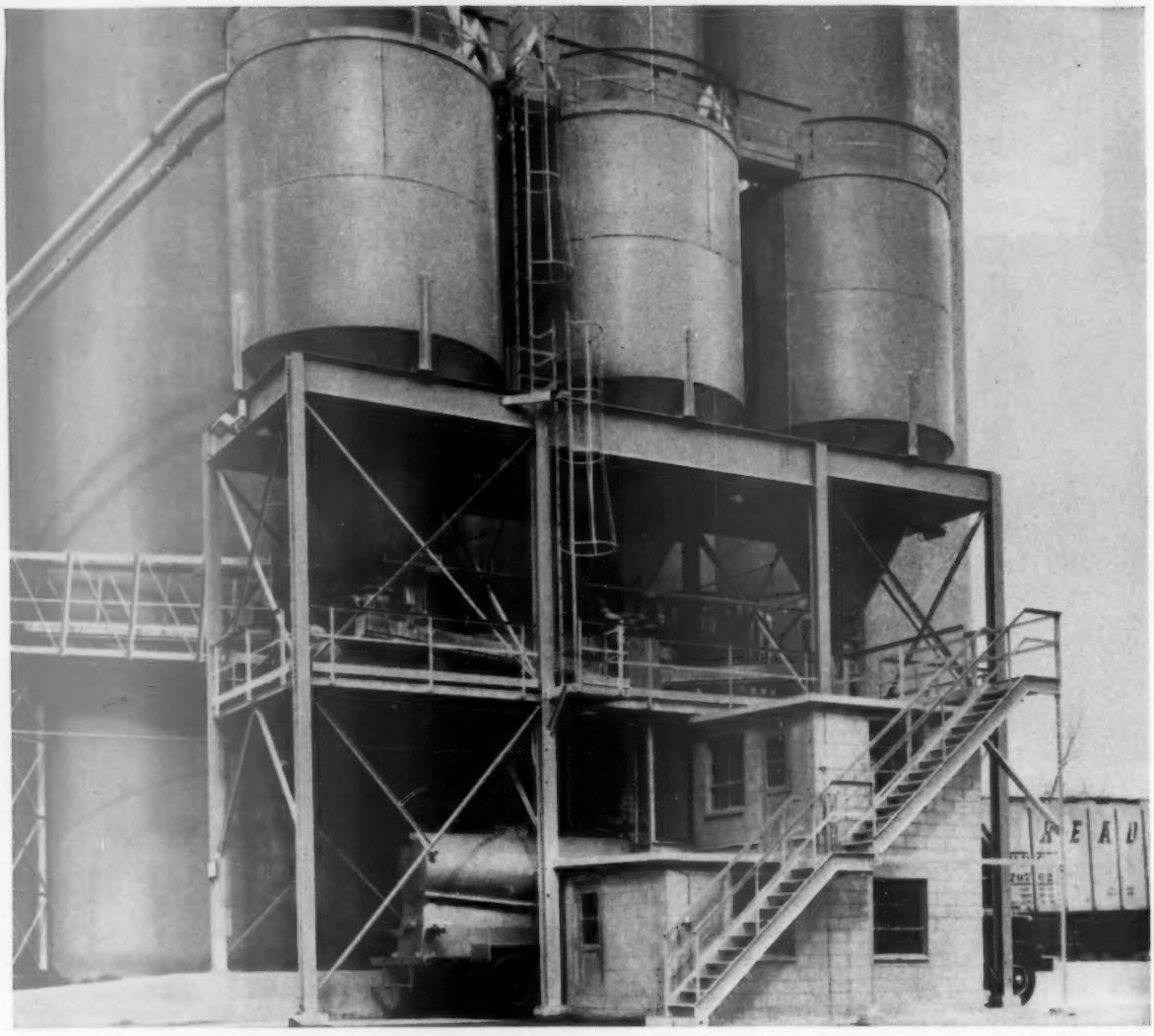

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PIT and QUARRY

NOVEMBER 1960
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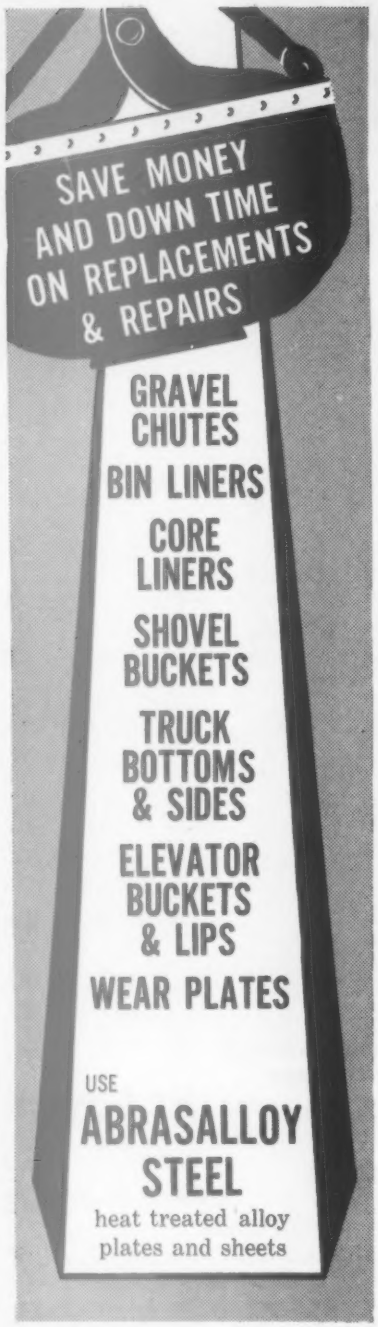

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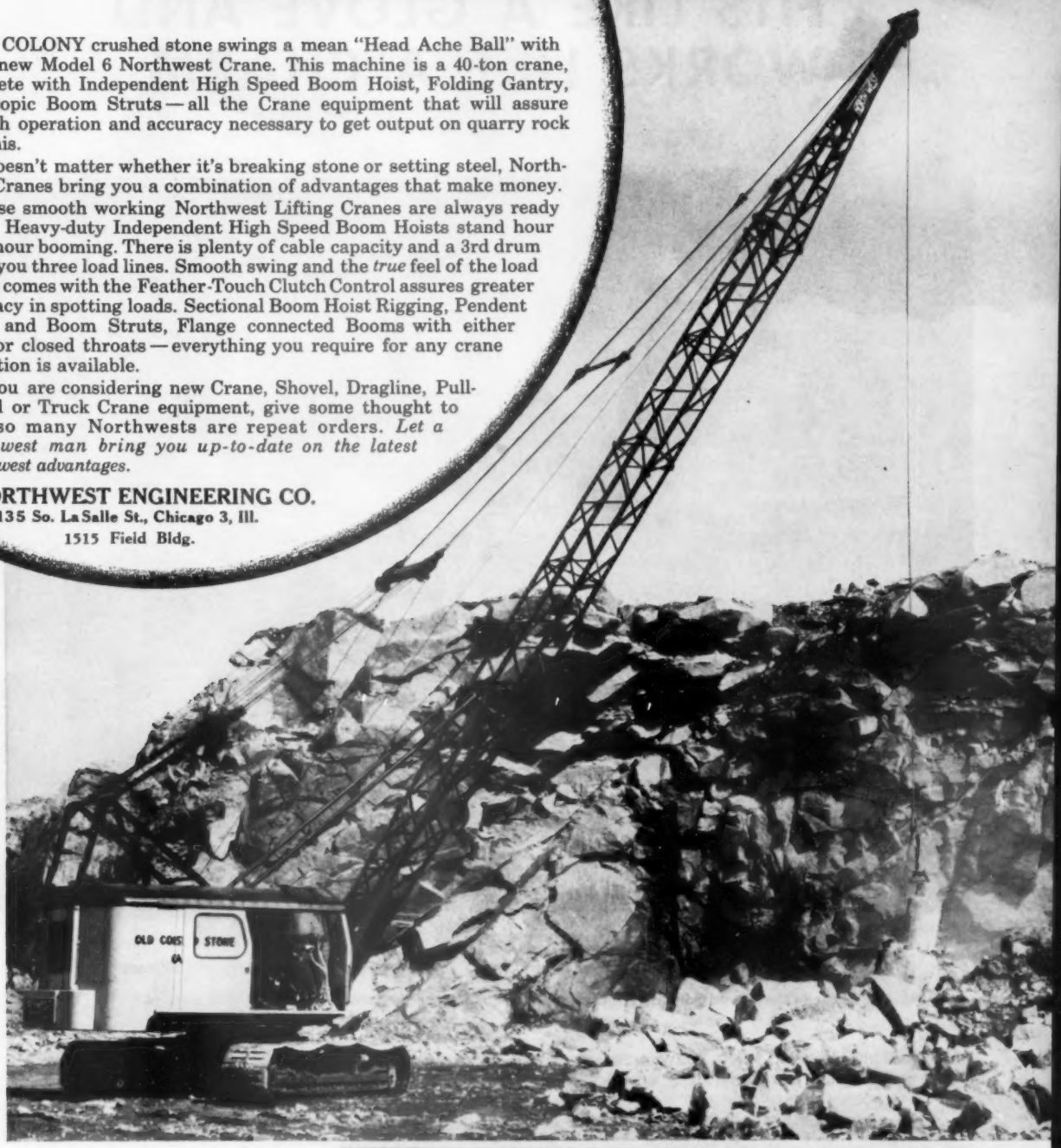

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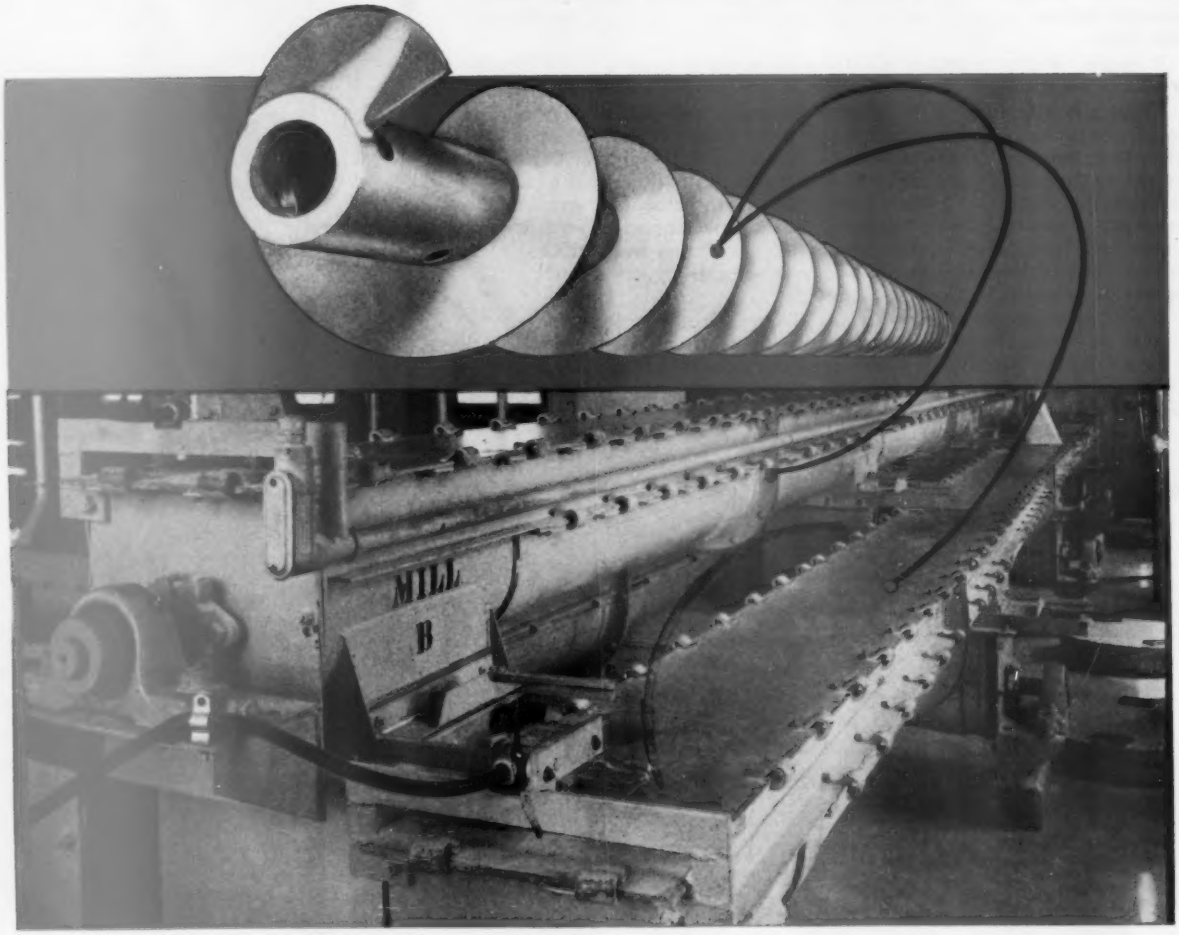

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With Link-Belt, screw conveyor engineering includes far more than just supplying a suitable product. All related aspects of your production are considered—including prior and subsequent handling, plus integration with other equipment. And because Link-Belt handles all details from specification to erection, it means a better-working system with less work for you.

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Needed: 190 tons of ¾" minus aggregate per hour

New Diamond Plant Gets Job

Another feature that impressed Frank Strausberg is the portability of the new Diamond model 70 rotor-lift crushing plant. It is equally at home on the road or in the pit.

When Frank Strausberg & Son, Saginaw, Michigan contracting firm, was awarded a contract for aggregate for asphalt surfacing and shoulders on State Route 57, it needed a crushing plant that had plenty of capacity and portability. Diamond Iron Works sales engineers were called in and asked for their recommendations.

Based on a thorough and convincing analysis of the problem, Strausberg purchased the *new* Diamond model 70 rotor-lift crushing plant. Here are the results. Currently, it is producing ¾" minus aggregate for asphalt surfacing at the rate of 190 tons per hour. All material is pit run requiring 48% crush and subject to state check four times a day. The plant is moved about every three days in the pit, or to other pits. It has more than lived up to expectations for high capacity and portability. Also, of particular importance has been the smooth performance plus an unusually low horsepower requirement.

Other Features of the New 70

- **10" x 36" roller bearing jaw crusher**
- **32" x 24" star gear roll crusher—a large crushing area for more crushing per revolution of rolls**
- **4' x 12' 2 ½-deck screen that provides more than adequate screening area**
- **30" conveyor belts throughout (5-ply, 28 oz.)**

High output, portability and economy of operation . . . that's what the new 70 has done for Frank Strausberg & Son . . . that's what it can do for you. See your DIAMOND distributor for the full story.

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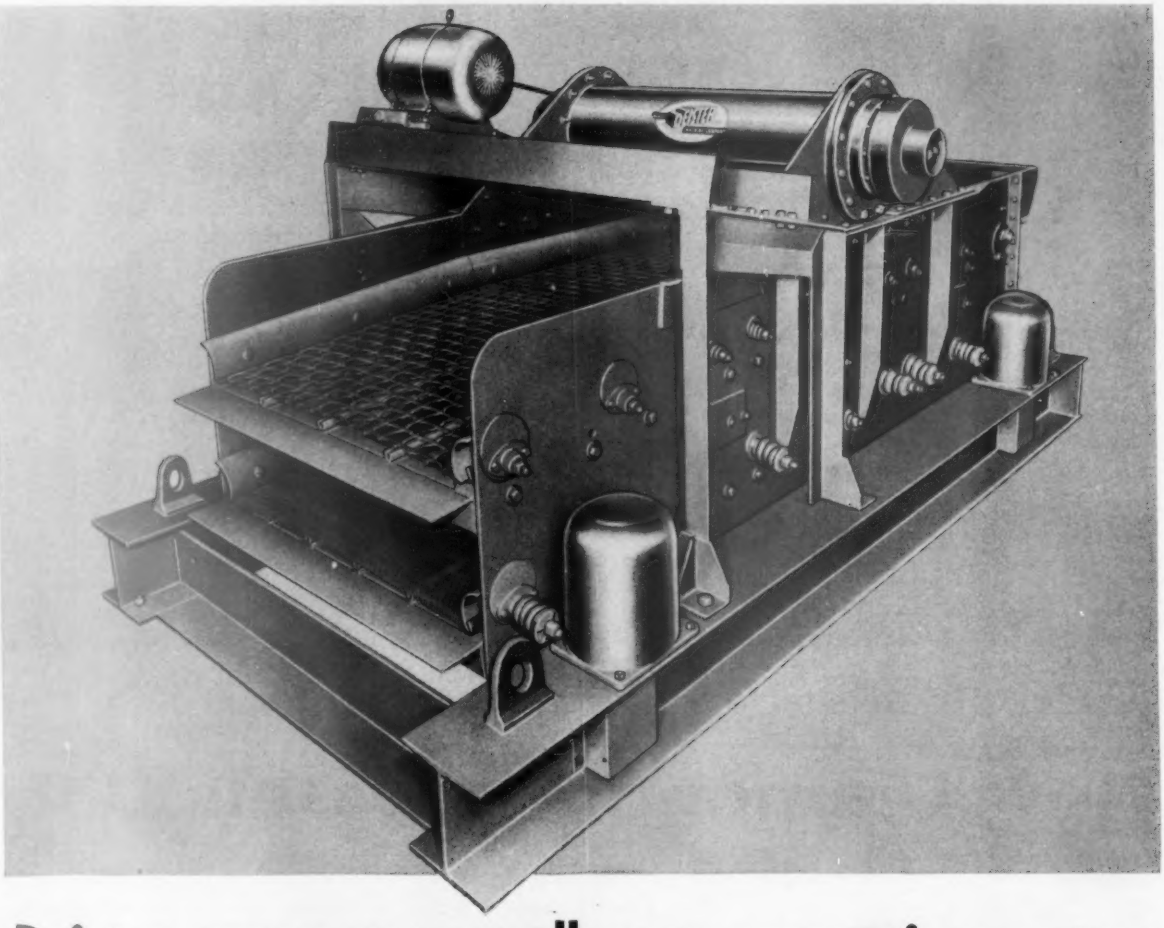


Deister announces an all-new suspension system featuring ENCLOSED Spring & Rubber MOUNTS

"To provide the lowest cost per ton of material screened with the least amount of attention and downtime" —this has been the Deister objective throughout 35 years of vibrating screen manufacture.

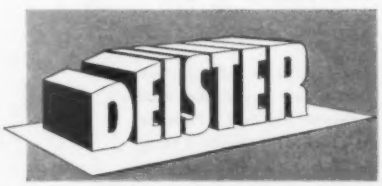
In line with this objective, Deister Machine Company has now developed an all-new suspension system for the "live" or vibrating frame of its line of vibrating screens. It consists of a heavy H-beam stationary base on which are mounted ENCLOSED Spring and Rubber MOUNTS to carry the "live" frame.

The new mounts are located *outside* the side plates at the four frame corners. Each mount consists of a heavy coil spring working in conjunction with a solid rubber isolator *to eliminate completely* the transmission of vibration to the supporting structure.

Each mount is protected by an easily removed cover. Spring adjustment or replacement, if ever necessary, becomes a simple "wrench" job that can be done in a matter of minutes.

No extra cost is involved if cable suspension is desired. Cables can be attached directly to the four lugs on the base. The effectiveness of the new mounts eliminates the need for cable suspension springs.

In order to simplify installation, Deister Vibrating Screens are supplied as a complete package instead of separate parts. The vibrating frame, stationary base, motor support and V-belt drive are assembled into a properly coordinated unit at the factory.



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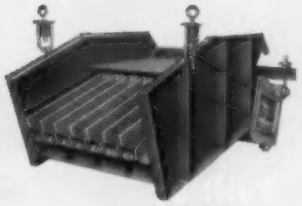

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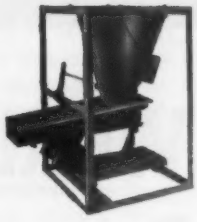

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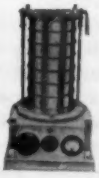

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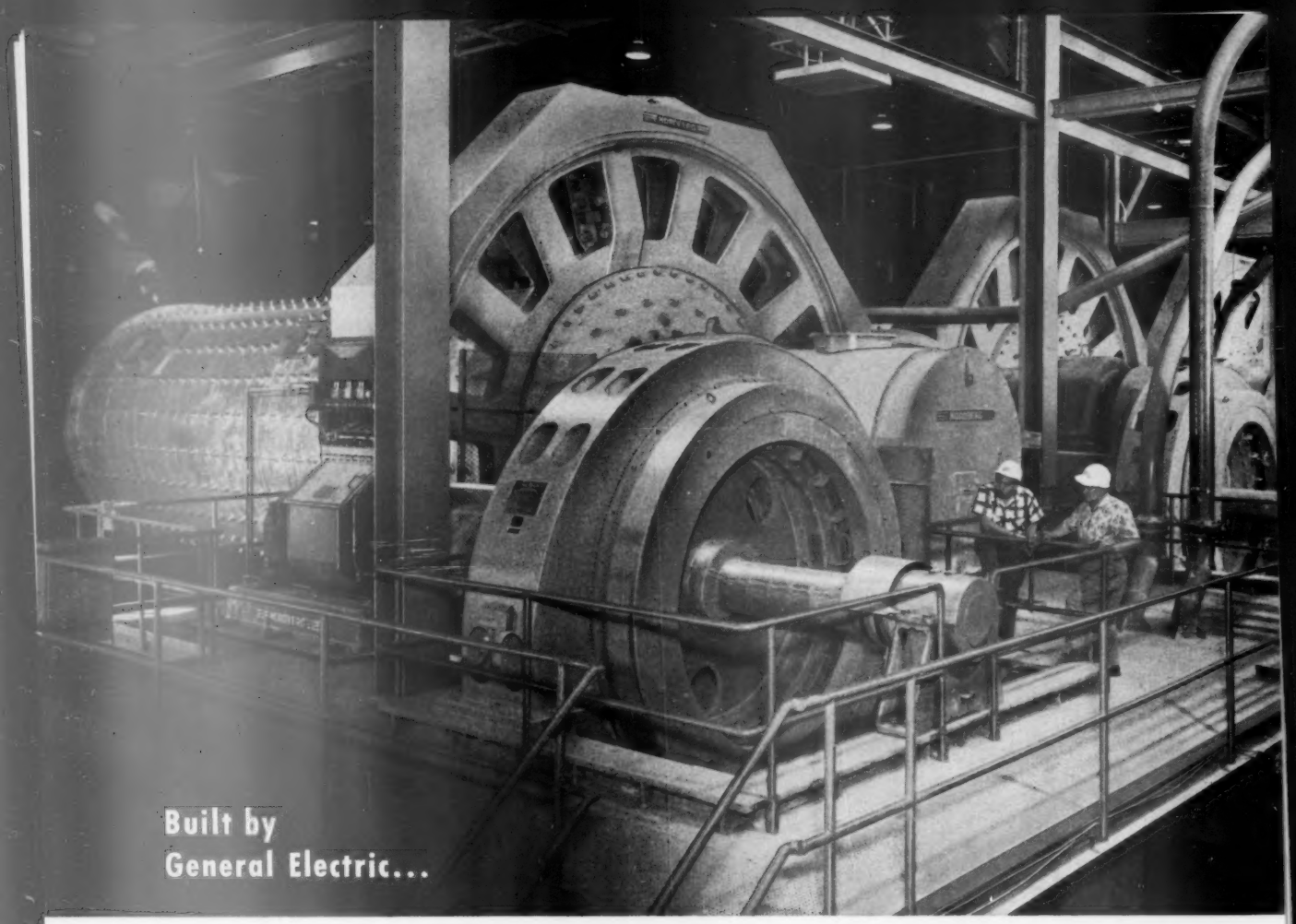

WORLD'S LARGEST Ball-mill Motors Power Huge Cement Grinding Mills

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Each of these massive mills contains 400,000 pounds of steel balls plus the tons of material to be pulverized. To drive these immense loads, General Electric designed and built into five 2500 horsepower synchronous motors the "know-how" gathered from years of experience with ball-mill motors.

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Engineering and manufacturing experience obtained by General Electric in building hundreds of motors for ball-mill drives, and the proved, dependable performance of G-E synchronous motors on all types of heavy-duty applications, assure you of motors that will withstand unusual demands and require only a minimum of maintenance.

The next time you need drive motors for heavy, continuous-service equipment, be sure to call in your General Electric Apparatus Sales Engineer.

In the meantime, you can obtain more information on G-E synchronous motors by writing for GEA-5959, Section 775-13, General Electric Co., Schenectady 5, N. Y.

LARGE MOTOR & GENERATOR DEPARTMENT

GENERAL ELECTRIC

Washington News Letter

By S. HERBERT UNTERBERGER

WHEN the Presidential election is behind us, the question of what is happening in the economic sphere can, for the first time in many months, be regarded reasonably objectively without direct political overtones.

It is a generally acknowledged fact that we have not been doing well economically in 1960. The question is whether what is happening is "a sidewise movement" or a "recession." The consensus, at least in Washington, is that it is still too soon to know whether the present trend is severe enough to be called a recession.

As a consequence, many other terms are being used which have even less precise meanings. The favorite one is "adjustment." There has also been some revival of the semantics of the 1957-58 business decline in the use of the term, "rolling readjustment." The word "recession" is about as low as we permit our descriptive terminology to go, since the word "depression" by common consent, has become virtually outlawed because of its deep psychological associations.

Since these rather loose terms are greatly in need of definition, the New York *Times* recently asked Arthur S. Burns, now president of the National Bureau of Economic Research (and formerly chairman of President Eisenhower's Council of Economic Advisers), to define the terms. His analysis runs as follows:

"Terms such as 'recession,' 'adjustment,' 'lull,' and the like do not have any recognized scientific meaning. In recent years, however, the term 'recession' has been widely used to refer to a decline of aggregate economic activity which is (a) of moderate size, (b) fairly widespread, and (c) lasts from about 8 months to a year or a little longer. The term 'adjustment,' when applied to the economy as a whole, is used more loosely. More often than not, it refers to a roughly sidewise movement of aggregate economic activity which stems from efforts of business men to bring inventories into better balance with sales and which, it is expected, will be followed by a renewal of general expansion in production and employment."

With this background, in mind, it may be easier to assess present cross currents of economic analysis.

The fact that industrial production has been virtually level this year appears to be creating the uncertainty. The decline in steel and autos has been largely offset by increases in other industries. What is most troublesome is that the next event following such a plateau may be either a rise or a decline. The plateau which extended from August, 1950, to August, 1952, was followed by a boom late in 1952 and in 1953. In contrast, the plateau which extended from December, 1955, to August, 1957, was followed by the downturn into the 1957-58 recession. There are three attitudes toward what is likely to develop.

The relatively pessimistic school is typified in the analysis issued by the Chase Manhattan Bank which concludes, " . . . The current picture is not one of an economy girding itself for a vigorous advance. Only two major sectors—government and consumption of nondurables and services—appear to show expanding trends that could extend into next year. Such key areas as business investment in new plant and equipment, inventories, housing, and durable consumer goods exhibit at best stability."

In arriving at this conclusion, these analysts pointed to five key considerations:

1. Inventory buying has seesawed up and down, but overall inventories are about as high in relation to sales as before the two previous business cycle downturns.

2. Plant and equipment expenditures, while up somewhat, have not shown a vigorous recovery, by past standards. Recent surveys show that business plans to hold expenditures level for the remainder of the year.

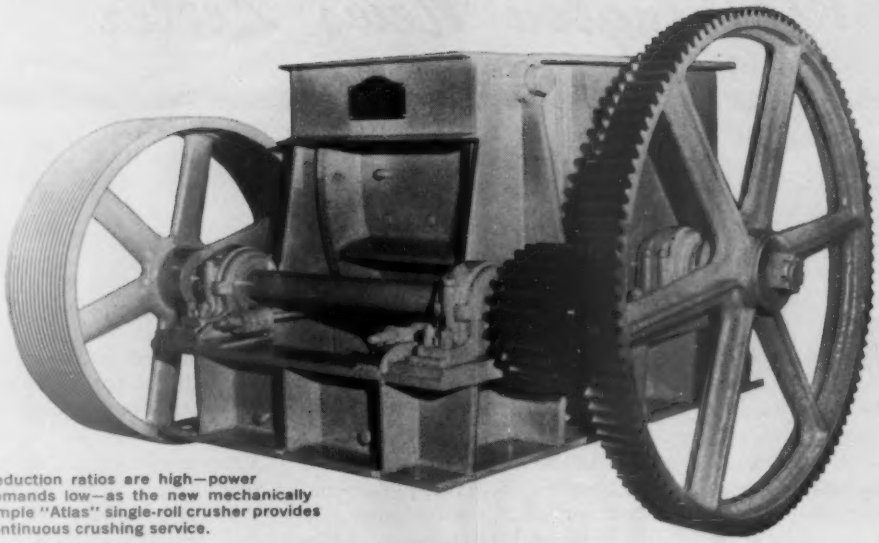
3. Housing starts continue to decline, and there is no certainty that, even with a further increase in credits, there will be any significant increase.

4. Government expenditures have been level for more than a year. However, there is some indication of a small rise.

5. Surveys show that consumers, despite an increase in their incomes, are increasingly hesitant about buying durable goods.

The middle view is, as might be expected, the official view as reported by the United States Department of Commerce. Although that department reports that business activity continues relatively high, its spokesmen have conceded certain problem areas. Among these are manufacturing employment output, which is off a little although activity elsewhere was well maintained. Although plant and equipment investments and purchases of services by consumers and government were

(*Continued on page* 32)



Reduction ratios are high—power demands low—as the new mechanically simple "Atlas" single-roll crusher provides continuous crushing service.

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This new "Atlas" crusher is job-engineered for *economy*, *performance*, *capacity*—on crushing a variety of materials demanding machine ruggedness somewhat less than required in other crushing operations.

These are compact, powerful, single-roll machines that will give years of trouble-free crushing service at a cost of a fraction of a cent per ton. "Atlas" crushers fit well into production lines. They are built for continuous crushing, and can be started or stopped at any time.

Basically a primary crusher, with its 18, 24 or 30-inch roll diameters handling feeds of 14, 20 and 26 inches respectively, the "Atlas" also serves under many conditions as a secondary crusher.

CHECK THESE FEATURES

Low headroom requirements • Compact • Economical • Large capacity • Continuous crushing • Minimum of fines • Low power demand • Large receiving hopper • Minimum attention • One-pass, non-clog crushing • Wide range of size adjustment

With the addition of this new "Atlas", Pennsylvania now offers the widest range of single-roll crushers in the industry—permitting precise job-engineering of the exact machine for each application.

FREE BULLETIN

Full information and operating details on "Atlas" crushers are described in new Bulletin 2025. Send for a free copy today.

PENNSYLVANIA CRUSHER DIVISION
BATH IRON WORKS CORPORATION
WEST CHESTER, PENNA.

★ ★ ★

Over 50 years concentrated experience in all types of material reduction makes Pennsylvania your best source of crushers and engineering advice and service. Call on Pennsylvania with your next crushing problem. Representatives from coast-to-coast and abroad.

PENNSYLVANIA CRUSHERS

BATH-BUILT

Labor Developments

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

FOR most of the years since the federal labor laws have been controlling the conduct of labor relations in the United States, the usual penalty for the violation of labor laws or agreements has been the requirement of specific performance. That is, the guilty party has been required to do something or to cease and desist from doing something. Only recently, particularly since the Taft-Hartley Act has granted the federal courts a large measure of authority in these matters, has there been recourse to monetary damages — payment of specific sums of money by the guilty party to compensate for actual or potential losses. Two cases decided recently illustrate some extremes to which this new policy has been carried.

The Runaway Shop Case One of these cases, which was decided by the Federal District Court sitting in Philadelphia, involved the situation of a shoe manufacturer who, for almost 40 years, had been operating his plant in the city of Philadelphia. For approximately 20 years his employees had been represented by a particular union, and there had been a regular contractual relationship between the union and the employer.

During all of these years each of the successive contracts had contained a provision forbidding the removal of the manufacturing operations from Philadelphia for any reason during the life of the contract. Nevertheless, during the term of the contract which expired on December 31, 1957, the company moved its plant to another city in Pennsylvania, where it had been operating on a non-union basis. An attempt made by the same union to organize the workers in that plant failed.

This is probably the first case in which a federal court has been called upon to supply a remedy for a "runaway shop." Previously, the National Labor Relations Board had dealt with this problem in a number of ways. For the most part, it regarded this action as an unfair labor practice, deeming it a deliberate move to avoid the requirement for bargaining with the union.

The remedies ordered by the NLRB were, generally, to require the employer to offer reinstatement to the previous employees at the new plant, ordinarily with transportation expenses paid. In some cases, that Board attempted to require the return of the plant to the old location. Such remedies, while severe, rarely accomplished very much because they were rarely complied with fully.

In this case, the court was of the opinion that ordering the firm to move the manufacturing operations back to Philadelphia would create an unwarranted economic hardship and that ordering the employer to offer jobs at the new plant together with transportation expenses would be impracticable.

At the same time, the court considered that the union had suffered severe losses from the manufacturer's "running away." In arriving at this conclusion the court reviewed the collective bargaining relationship of 20 years' standing and observed that the obvious purpose of the "runaway shop" provision was to provide the employees with some measure of job security in the highly mobile industry of shoe manufacturing.

The ability of the union to assure a shoe worker of his job in such collective bargaining agreements was, of course, gravely undermined in the working community by the employer's move. In addition, the union had suffered a serious financial loss in terms of net income as a direct result of the employer's breach of the contract.

Acccordingly, the court sought first to make the union whole for its financial losses. In doing so, it assumed that if the firm had not moved away, it would probably have continued doing business in Philadelphia for at least another 20 years, and the union would have collected the regular monthly dues from at least the number of employees engaged at the time of the move for that length of time. It thus calculated the total dues lost, including the dues lost to the date of the decision, at approximately $28,000. This amount was awarded to the union.

In addition, the court went further and awarded punitive damages. Here, the court was completely candid in saying that the federal labor laws did not specifically give it such authority. However, it pointed to the fact that the Supreme Court of the United States had specifically directed judges of Federal District Courts to exercise their judicial inventiveness in fashioning federal law to remedy breaches of collective bargaining.

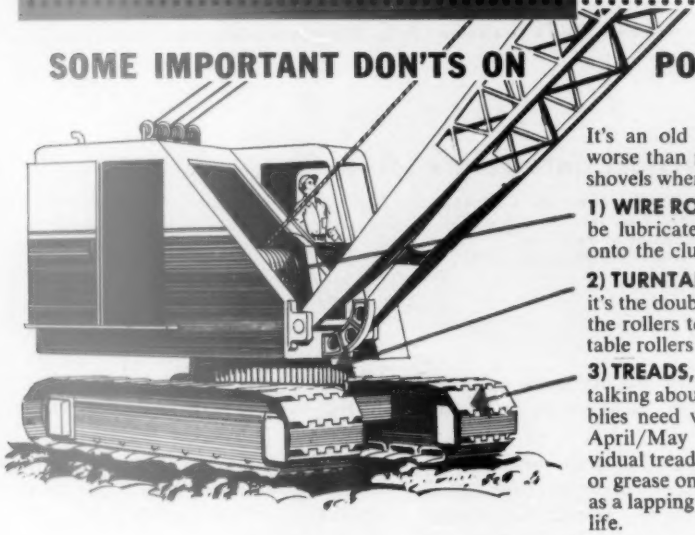
In view of the fact that the removal of the plant was not only a breach of a private contract but also a violation of the Federal Labor Law in that it was done for the purpose of avoiding the firm's bar-

(*Continued on page* 32)

LUBE LOGIC

Three time and money savers

SOME IMPORTANT DON'TS ON POWER SHOVEL LUBRICATION

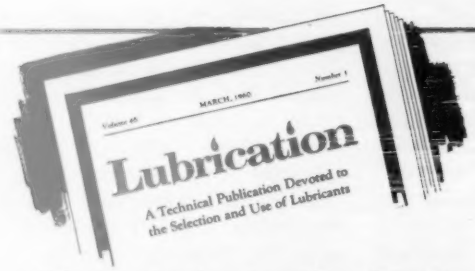


It's an old Texaco maxim that over-lubrication is sometimes worse than none at all, and there are three vital spots on power shovels where this is particularly true:

1) WIRE ROPE that winds onto drums fitted with clutches should be lubricated very sparingly; otherwise, the lubricant may get onto the clutch faces and cause slipping.

2) TURNTABLE ROLLER PATH should never be lubricated, unless it's the double-flange type with hook rollers. Lubricant will cause the rollers to slide and wear flat. Lubricate the bearings of turntable rollers sparingly to avoid drip on the turntable path.

3) TREADS, for instance, should never be lubricated at all. (We're talking about the tread only now; the track rollers or idling assemblies need very different treatment, which we discussed in the April/May 1960 Lube Logic). The pins that connect the individual treads are designed to operate without lubrication. Any oil or grease on these pins will pick up abrasive dirt which would act as a lapping compound on the pins and drastically shorten service life.



The whole truth about mobile lube rigs

What does it take to make a mobile lube rig? What do you put on it? How do you use it? The questions have been coming in so fast lately that Texaco has devoted a whole issue of its magazine, *Lubrication,* to answering them: the March 1960 issue, titled "Mobile Lubrication Equipment."

Lubrication is a major factor in cost control, and lube rigs can be a major factor in thorough maintenance, so send for your free copy of the March *Lubrication.* Supply of these valuable booklets is limited, so if you want one, send in your request *now* to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Department EM-20.

End-of-shift is best fueling time

They say there's a time and a place for everything, and for refueling your equipment the best time is the end of each day's work. And here are two reasons why: End-of-shift fueling minimizes the possibility of fuel-tank rusting, because there's no room for condensate to form in a tank that's full of fuel. And tank-bottom sediment, stirred up by incoming fuel, has a chance to settle down overnight, so it won't be drawn into the fuel line.

TEXACO LUBRICATION ENGINEERS

If LUBE LOGIC doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."
Texaco Inc., 135 East 42nd Street,
New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report,
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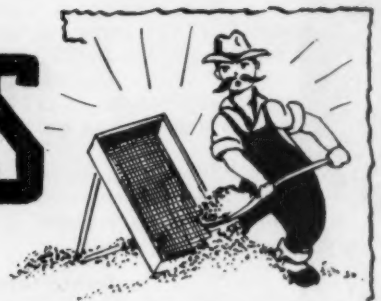
TEXACO

Throughout the United States
Canada • Latin America • West Africa

SCREENINGS



By RAY L. SMITH JR.

SPECULATIONS on the velocity of winds generated by Hurricane Donna has finally been settled by the Miami Weather Bureau which estimated that the winds wound up to 180 miles per hour at their height.

Winds of maximum velocity raked the Marathon to Matecumbe area, the Weather Bureau reported, while the Tavernier sector was ripped by winds of about 120 miles per hour.

Donna was classified as the "most destructive hurricane" ever to strike Florida. The next most damaging hurricane occurred in 1926 in the Greater Miami area.

Donna's damage has been estimated officially as between 350 and 500 million dollars. Damage in the hurricane of 1926 was placed at 75 million.

Donna's eye passed just north of Marathon between 2 a.m. and 2:30 a.m. Saturday, Sept. 10 pushing a six-foot tide across most of the Keys.

Leaving the Keys, Donna roared across Florida Bay and smashed the Everglades National Park community of Flamingo with 150 m.p.h. winds crushed the City of Everglades, and raked Naples. Punta Gorda was hit by winds of 130 m.p.h. while Fort Meyers was battered by winds up to 121 m.p.h.

The hurricane was blowing at better than 100 m.p.h. as it crossed the state and passed out into the Atlantic near Daytona Beach Sunday.

As mentioned last month, Donna was no lady!

Hurricane Aid

OVER THE YEARS we've run items involving the use of concrete mixers for purposes other than mixing concrete.

Hurricane Donna created a new use for the mixers when she smashed sections of the 18-inch pipe line supplying fresh water from Florida City to Key West.

Yep—you guessed it—several outfits brought in concrete mixers filled with the first fresh water, some 80,000 gallons in all.

Potpourri and Succotash

When it comes to the fair sex, the Navy has a system all its own in the way they rate their personnel.

"It's this way," said the old salt to the boot, "when a sailor has one dame, we call him a destroyer; two girls, we call him a cruiser; three babes and we call him a battleship."

The boot was impressed. "And how do they rate you in this man's navy?" he asked.

The old timer shook his head sadly. "Son," he muttered, "shake hands with a rowboat!"

An old friend complained bitterly that his wife was making his life a hell on earth. "How long have you been married?" another friend asked.

"Twenty horrible, unbearable years," he groaned.

"Why don't you leave her?"

"I'd have walked out long ago," admitted the friend, "but I just can't bear the thought of kissing her goodbye."

A business executive, worried over sales and administrative problems in his company, found himself suffering from insomnia and asked his doctor for some sleeping pills. The doctor gave them to him, but the next morning he was back.

"They didn't help at all," he told the medico. "I want stronger pills."

"But those are the strongest I have," countered the doctor.

"You gave my wife stronger pills when she was pregnant," argued the drowsy-eyed executive.

"Yes," agreed the physician, "but, those were for labor."

"You see," sighed the businessman, "it's just as I've always suspected. Everything for labor, nothing for management."

Explorer: "We were surrounded by savages. They uttered awful cries and beat the ground with their clubs."

Bored Listener: "Golfers, probably."

"I see where a Russian says he has invented a game which closely resembles golf." "That must be the game my husband has been playing for years."

It is not difficult to believe the TV songster who said he owed his success to his mother because she wouldn't let him take singing lessons.

A man looking at some neckties tossed one or two aside contemptuously. He noticed that the clerk put those he had so positively rejected in a separate box.

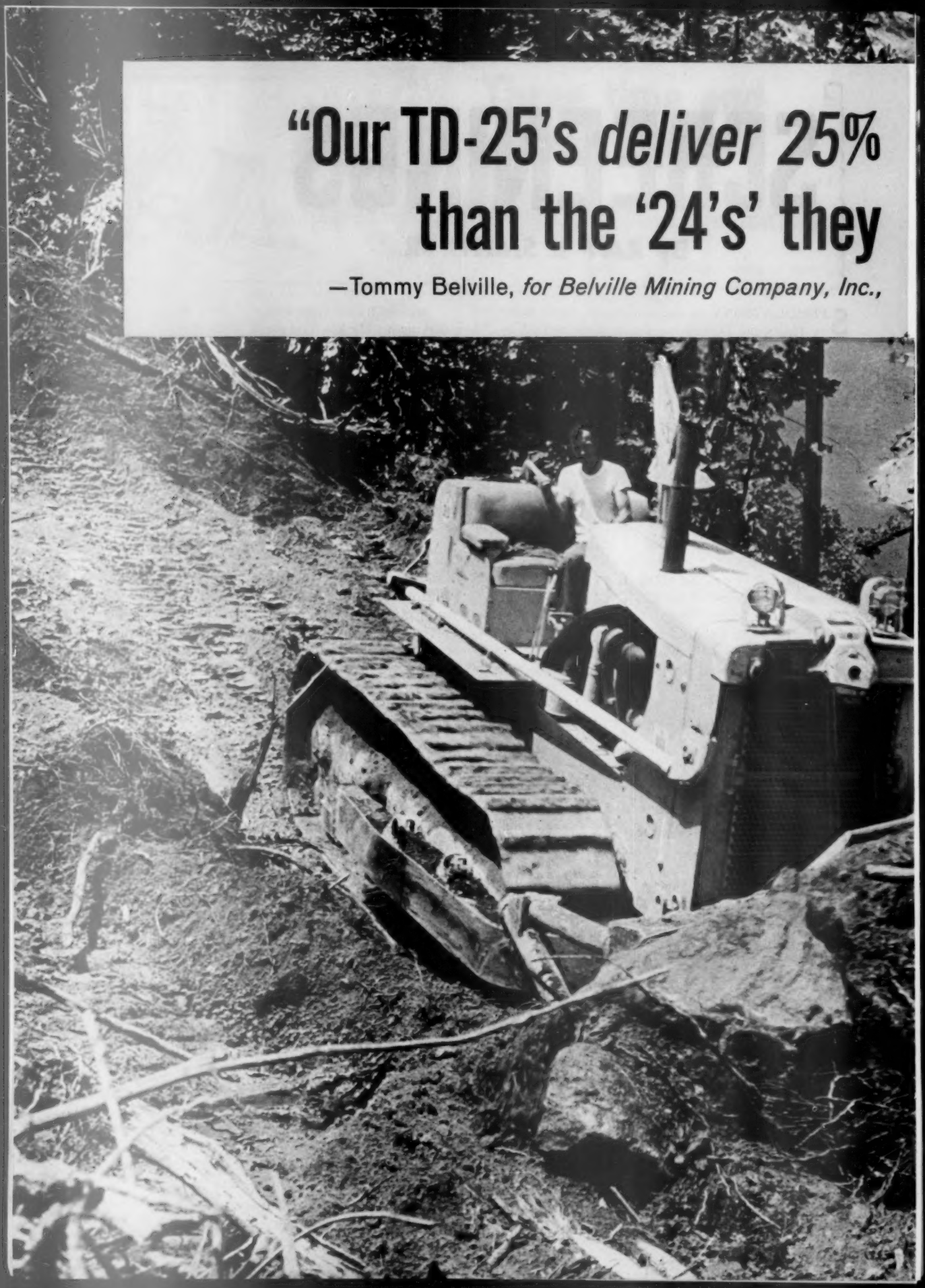
"What becomes of those?" he inquired.

"We sell those to women who come in here to buy ties for men."

"Mommy, Mommy," bawled the little girl, "Daddy just poisoned my kitty."

"Don't cry, dear," replied the mother sympathetically, "Maybe he had to."

"No, he didn't" screamed the heartbroken child. "He promised me I could."



"Our TD-25's *deliver 25%* than the '24's' they

—Tommy Belville, *for Belville Mining Company, Inc.,*

more load replace"

Ironton, Ohio

"Our three International TD-25's are delivering 25% additional load, compared with previously-owned TD-24's," reports Belville Mining Company, Inc. "The TD-25 has more power to work at faster speeds without loss of motion.

"Another big advantage of the TD-25, mighty important in outcrop cutting, is you can back it up extreme grades at the faster speeds without changing gears."

"Belville" teams "25's" with a 7-cu yd dragline and a 2½-cu yd stripping shovel—to remove overburden as deep as 60 feet. The tractors are also used to level for the shovels, clean coal, construct roads.

"Live track" power-steering!

Like the TD-24, the TD-25 gives you exclusive "live track" Planet Power-steering—to make full-load, full-power turns, or slam straight ahead with offset loads. With combined on-the-go, HI-Lo power-shifting, you get instant, up-or-down matching of power to condition.

You turn with the dozer fully loaded, without spillage. You get constant-contact benching or highwalling, applying full power, getting full speed. You eliminate "dead-track drag" and "gear-shift lag."

With exclusive new International DT-817 Diesel engine wallop, the "25" bulls along, 230 turbocharged hp strong—without "slow-motion" lug-downs. New TD-25 seven-roller tracks are strength-matched to full engine effort. And the "25" is platformed on super-rugged double-box-beam frames to meet slam-bang conditions!

See what it means in extra profits to beat the famous TD-24 by 25% or more. Compare planet-drive "25" ability to outearn king-size clutch-steered rigs by amazing margins—clearing land, blading rock, benching, mass-production overburden removal. Let your International Construction Equipment Distributor demonstrate.

◀ **Benching an access road** on a 1-to-1, or steeper, mountain slope. The operator of this Belville-owned TD-25 takes maximum advantage of "live track" Planet Power-steering—to gouge out stumps and boulders and cut shale—without "bank-nosing" or sluing. He simply operates the bank-side track in high-speed range, the other in low-speed range—for full-capacity, straight-ahead performance.

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE

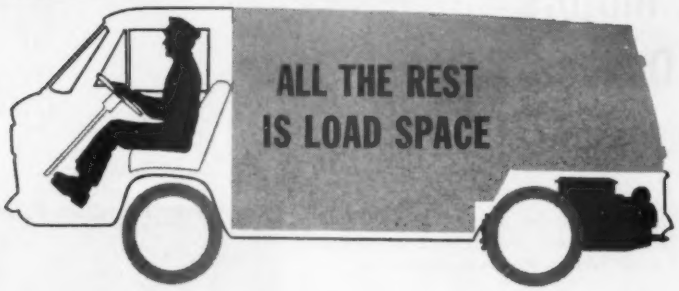
Two of "Belville's" TD-25's remove up to 50% of the overburden from a coal seam—produce 25% more than the "24's" replaced. Only simplified TD-25 planetary design gives you "live track" power-steering *and* on-the-go power-shifting. ▼

NEW FROM CHEVROLET

!!! WING-DING OF A TRUCK IDEA !!!

Here's a totally new kind of truck that gives you more load space than a conventional half-tonner, plus the inherent economy of an air-cooled engine! A truck that will carry up to 1,900 lbs. of payload (with a trim 4,600-lb. G.V.W.) on a nimble 95-inch wheelbase. A truck that measures only 15 feet long and devotes nearly 9 feet of it to payload! Dollar-saving performance starts with the engine—a space-saving "pancake" 6 that never needs anti-freeze or radiator repairs . . . and never stops saving fuel costs! Ideally suited for trouble-free truck duty, also, is the *tough* chassis build of Corvair 95, which includes frame and body designed as a rugged one-piece unit to

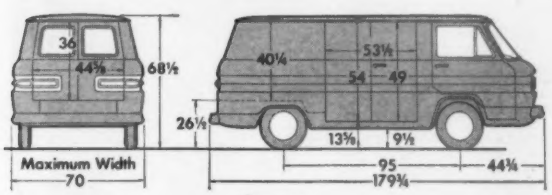
DRIVER'S UP FRONT . . . ENGINE'S IN THE REAR



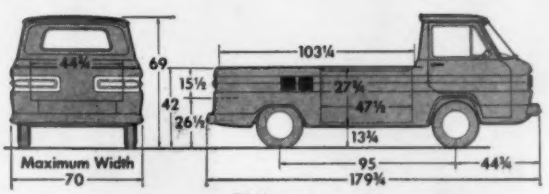
CORVAIR 95 ★★★★★ TRUCKS

withstand slam-bang runs. And there's *4-wheel independent suspension* (first time in a U.S. truck!) to take the roughness out of road surfaces. The list of Corvair 95 design advantages is as long as your arm. There's load space so accessible that the truck practically loads and unloads itself! There's exceptional driver comfort, easy maneuvering, snappy styling, and much, much more. It's a wing-ding of a truck idea—available in pickup and panel body versions. Visit your nearby Chevrolet dealer soon and get all the details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

★★★



Corvan



Pickups

New Corvan. There's a world of load space in this new Chevy panel—it's 109″ long, 60″ wide and 54″ high at center! Side doors take a 4′ x 4′ crate with ease. Left side doors are optional at extra cost.

New Rampside pickup. Roll out those heavy loads—there's nothing to it in this one! Ruggedly built side gate drops down to form convenient ramp for *easy* loading or unloading.

New Loadside pickup. Gives you more load space than a conventional half-tonner. Also, optional extra cost *flat floor* provides 39 sq. ft. of loading area, and you can stow cargo underneath it, too.

Less truck weight allows more cargo weight! Corvair 95's weigh up to 1,200 lbs. less than other half-tonners . . . yet they'll carry up to 1,900 lbs. of cargo!

50-50 weight distribution! Husky 2,500-lb.-capacity front and rear suspensions carry nearly equal loads to reduce strain on chassis and tires.

More load space, less road space! Corvair 95's are 2 feet shorter than conventional half-tonners. But Corvair 95's carry bulkier cargoes!

Easiest to get around in! Turning radius (under 20 feet) is less than that of ordinary trucks. That means easier maneuvering and parking.

1961 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET

Variable speed a.c. motors simplify drives for Dundee Cement Co.

BROWN BOVERI

by Werner K. Haessler, Project Engineer, Brown Boveri Corp.

Cement mill operations make unusual demands on drive systems. Blower and kiln drives, for example, are in 24-hour operation making efficiency and power factor important. Speed must be varied to suit process and draft requirements. Speed must also be kept constant under varying loads.

The Brown Boveri rotor-fed three phase shunt commutator motor provides a precise, economical solution. It has better efficiency than any other variable speed drive and a high power factor. It provides simple, stepless speed control. And speed is practically constant under varying loads.

Low cost

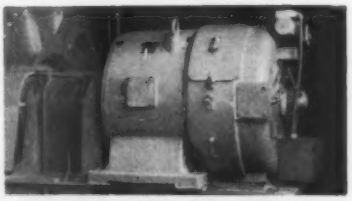
Speed is controlled by simply changing the position of the brushes with a servo-motor or handwheel; no motor-generator set, clutch or mechanical speed changer is required. No auxiliary switchgear is needed other than a standard starter.

Other advantages

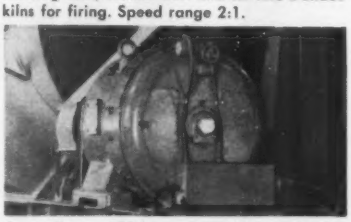
Full torque over entire speed range. Simple synchronization and adjustment of speed ratio or load balance for two or more motors.

A complete line

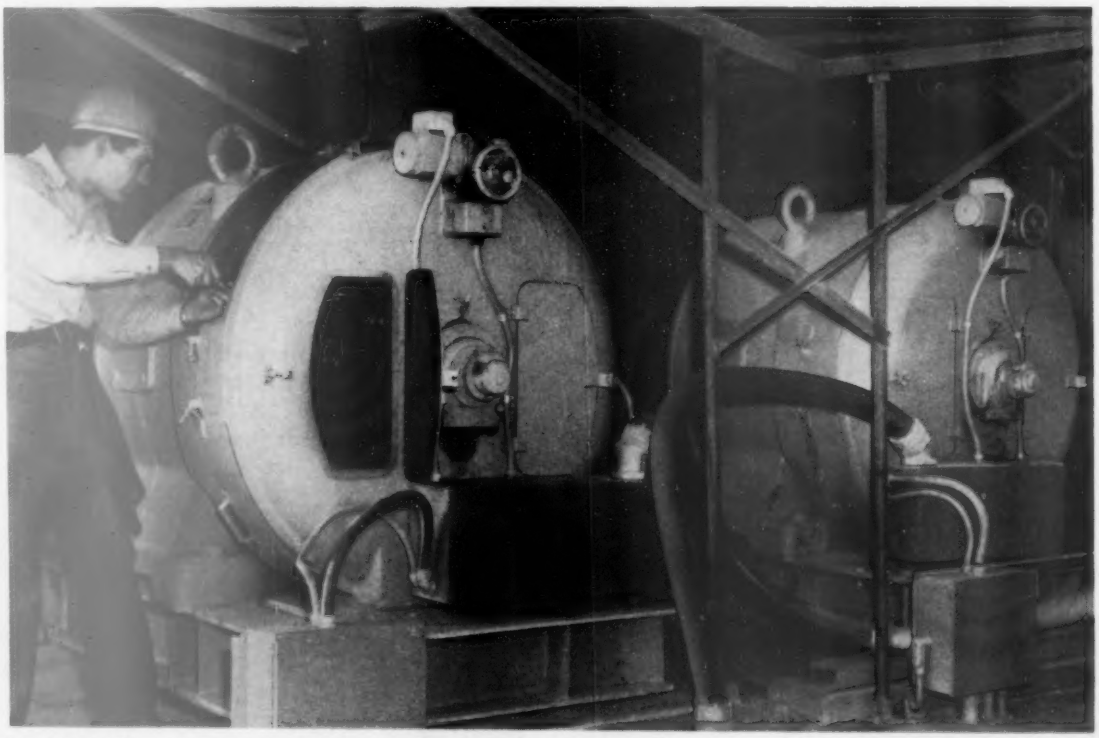
Sizes from 1 to 500 hp, speed ranges as high as 1:50 and designs for any mounting or exposure condition. Brown Boveri shunt commutator motors are in steady trouble-free service in the U. S. and around the world—driving blowers, kilns, printing presses, machine tools, conveyors, compressors, etc. Write for descriptive literature and Cost Estimate Questionnaire.



One of two 200-hp motors driving primary fans blowing coal, cement dust and air into Dundee kilns for firing. Speed range 2:1.

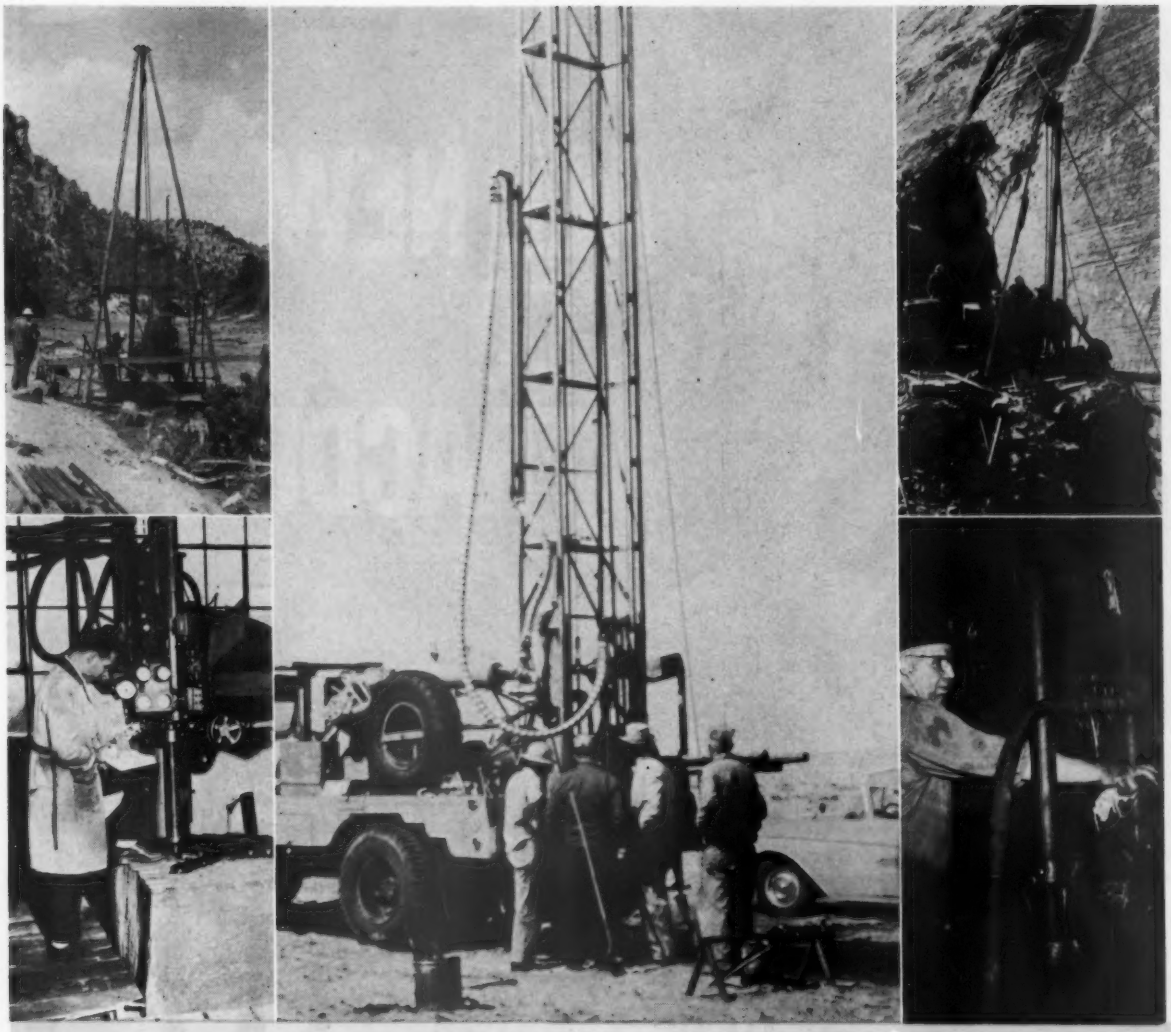


One of two 250-hp motors driving Dundee exhaust fans. Speed range 2.4:1.



Twin drive for kiln at new Dundee Cement Co. plant at Dundee, Mich. Each motor is 250 hp with speed range of 3:1. A simple regulator equalizes power input and thus equalizes the load. Brushes on commutator and slip rings are easily accessible as shown at left. The second Dundee kiln uses a similar twin drive. All motors illustrated are 440v, 60c.

BROWN BOVERI Brown Boveri Corp., Dept. PQ11, 19 Rector Street, New York 6, N. Y. Agents in 27 U. S. cities



Operate at "Less cost per foot" . . .

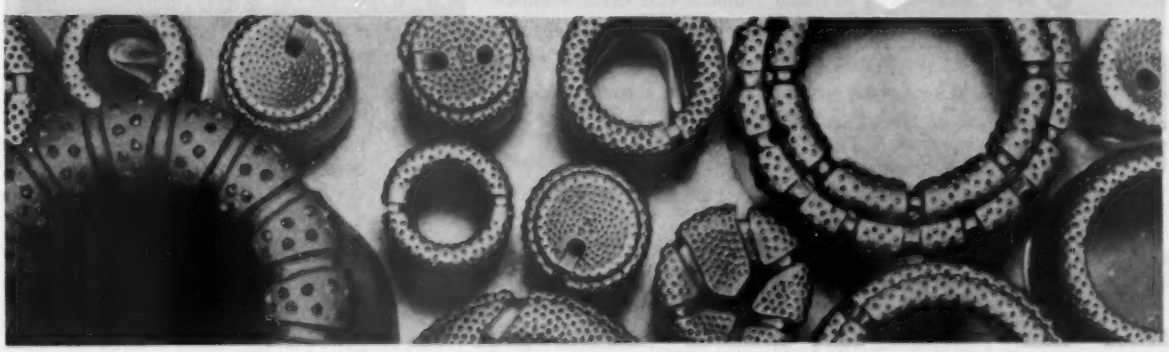
. . . with Christensen diamond bits and core barrels "engineered" for your particular drilling problem. Experienced field consultants are available regardless of your job location or scope of operations.

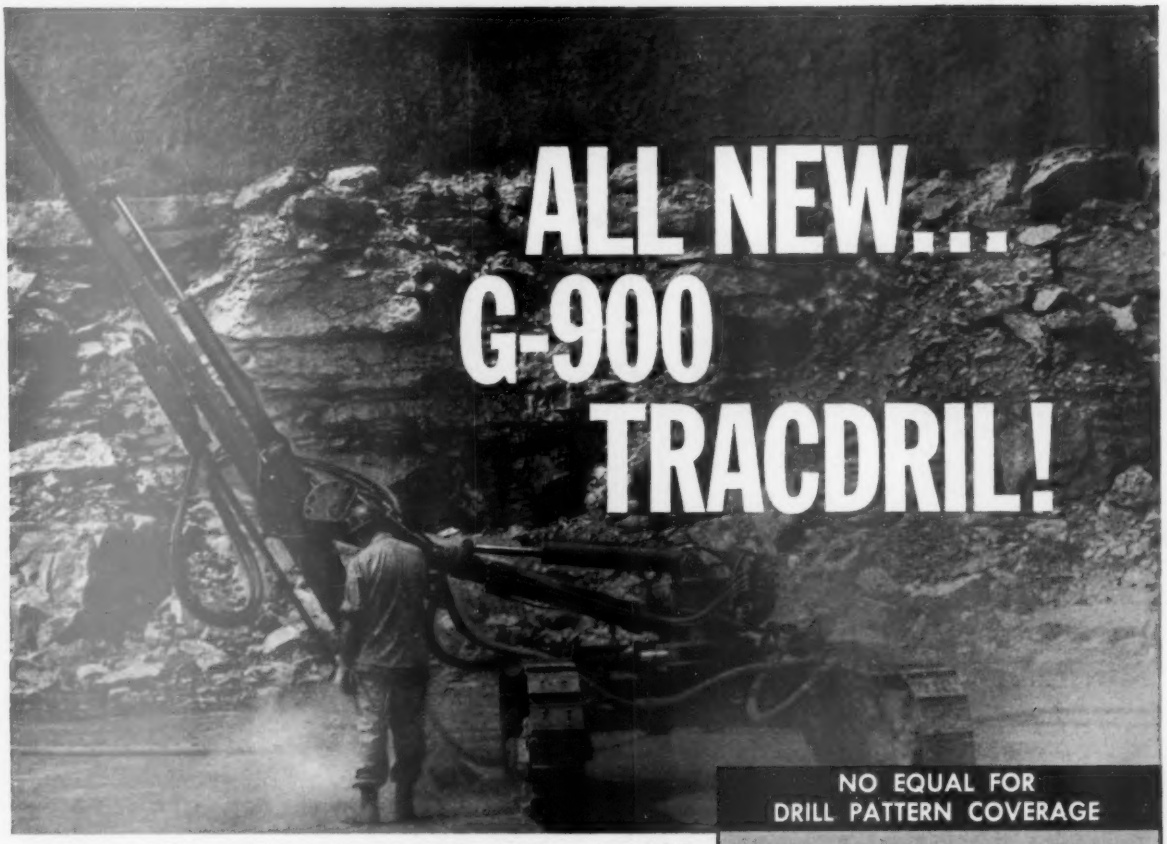
"Less cost per foot"

CHRISTENSEN DIAMOND PRODUCTS

MAIN OFFICE AND PLANT 1937 SOUTH 2nd WEST
SALT LAKE CITY, UTAH

SERVICE FROM WORLD-WIDE SALES OFFICES AND MANUFACTURING PLANTS





ALL NEW... G-900 TRACDRIL!

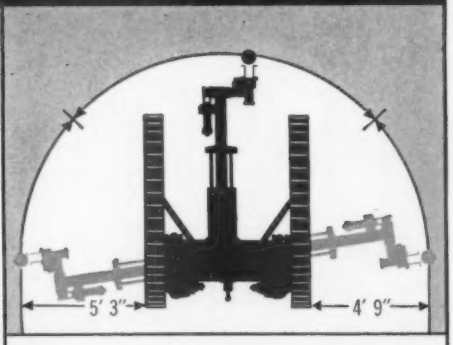
Unmatched versatility . . . drill boom is swung at right angles to tracks and drill carriage tilted inward for steeply sloped conditions.

The all new Chicago Pneumatic G-900 Tracdril is the culmination of 5 years of research and wide field experience. This self-propelled drilling unit is maneuverable, rugged and productive . . . a real *"drillers drill."* Extra large drilling radius because of its 180° horizontal boom swing and dual controls on turret and boom end for quick, accurate positioning of boom and drill carriage give the driller exceptional flexibility.
With the sensational 4½" Deep Hole Drill, it quickly sinks 3" holes up to 75 feet.

6 MAJOR EXCLUSIVES OF CP TRACDRILS

❶ **"Boarding house reach"** lets the drill carriage stretch out 63" beyond tracks to drill true verticals alongside the unit. ❷ **Extra-long Oliver tracks,** specially designed, provide stabilizing ground contact of 1350 square inches. ❸ **Sure-footedness and maximum traction** are assured with five lower track wheels. ❹ **Seven labor-saving hydraulic cylinders** ease driller's muscle work, give fluid-smooth action. ❺ **Two sets of grouped controls,** at turret and boom end, save time and steps for driller, boost footage. ❻ **"Dead man" automatic brakes** that slam on when tramming throttle is closed, locking unit on steepest slopes or bad ground.

NO EQUAL FOR DRILL PATTERN COVERAGE



- **Full 180° Ground Coverage . . . right or left. New G-900 drills true verticals at 90° angle to tracks.**
- Reaches "way-up" for extra high horizontal breast holes . . . to 11 feet.
- Big 85° carriage swing compensates for steeply sloped conditions.
- Keeps snake holes "way-down" and properly inclined . . . no interference from feed motors or crawler carriage structural members.

Full specifications and details in Bulletin SP-3627

Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • AIR-BLAST BITS • DIAMOND DRILLS • REICHdrills • ROCK DRILLS

News of the Industry

R. F. Brooks Joins Staff Of Desert Minerals, Inc. As Vice-President

Richard F. Brooks, has been elected a vice-president of Desert Minerals, Inc., and its sales affiliate, American Mineral Company, both of Los Angeles. He had previously been director of mining and raw-material development of Gladding, McBean & Company, Los Angeles.

Mr. Brooks was graduated from Brown University with high honors in geology. After service in the U.S. Navy he enrolled for a year as a graduate student in the Division of Geological Sciences at the California Institute of Technology.

He joined Gladding, McBean in 1948 as a quality-control engineer and in subsequent positions with that concern was responsible for technical programs in exploration, mining, minerals research, and development. For several years he managed Gladding, McBean's clay-beneficiation plant at Ione, Calif., and its operation at Indian Hill.

Richard F. Brooks

Desert Minerals, Inc., processes clays, talc, and whiting at its Los Angeles plant. The mined product is shipped in by rail from various deposits in the deserts of southern California. Finished products are marketed principally to the paint, ceramics, and insecticide industries.

Distribution Center Planned In Seattle by Ideal Cement

Bids were received (until October 5) for a cement storage and distribution terminal to be erected for Ideal Cement Company near the Duwamish Waterway in Seattle, Wash. The cost is estimated at $3 million.

According to plans drawn up by Ideal and Austin Company engineers, the new center calls for the erection of nine cement storage silos, a packhouse, offices, truck and rail-car loading facilities, and a wharf.

Coming Events

November 3-4, 1960—Washington, D. C. Annual meeting, National Slag Association, Hotel Mayflower.

January 17-19, 1961—Washington, D.C. Sixteenth annual convention, National Limestone Institute, Inc. Statler-Hilton Hotel.

January 17-20, 1961—Bal Harbour, Miami Beach. Annual convention, National Crushed Stone Association. The Americana.

January 23-26, 1961—Bal Harbour, Miami Beach. Joint convention, National Sand and Gravel Association and National Ready Mixed Concrete Association. The Americana.

January 30-February 2, 1961—Houston. Fifth annual convention, National Bituminous Concrete Association. Shamrock Hotel.

February 6-9, 1961—Los Angeles. Annual convention, Associated Equipment Distributors. Statler Hotel.

February 20-23, 1961—St. Louis. 57th annual meeting and exhibit, American Concrete Institute. Chase-Park Plaza Hotel.

February 26-March 2, 1961—Boston. Annual convention, Associated General Contractors of America. Hotel Statler.

February 26-March 2, 1961—St. Louis. Annual meeting, American Institute of Mining, Metallurgical, and Petroleum Engineers. Ambassador and Chase-Park Plaza hotels.

May 11-13, 1961—Point Clear, Ala. Annual convention, National Lime Association. Grand Hotel.

Construction Put in Place During September Maintains August Pace

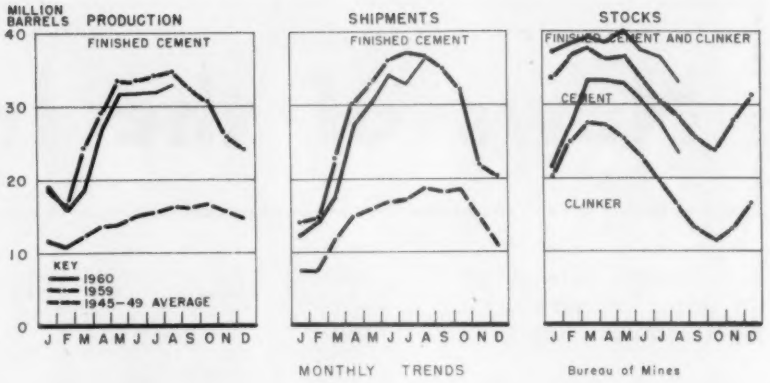
The value of new construction put in place in September, 1960, amounted to $5.3 billion, according to preliminary estimates of the U.S. Department of Commerce. This figure is up 1 percent from August, and has changed less than 0.5 percent from September, 1959.

The seasonally adjusted annual rate of total new construction was $55.4 billion (1 percent more than the equivalent annual rate in August, 1960, and about the same level as in September, 1959).

Cumulative value of new construction expenditures in the first nine months of 1960 was estimated at $40.8 billion—3 percent less than the total for the first nine months of 1959.

ITEMS: Private construction estimated at $3.6 billion, was about the same as in August, but 4 percent under September, 1959. Residential was estimated at $2.0 billion —1 percent less than in August, and 13 percent less than in September, 1959.

ITEM: Public construction, estimated at $1.7 billion, was up 3 percent from August, and up 9 percent from September, 1959.



— August, 1960, Finished Portland Cement —

SUMMARY—Production of finished portland cement in August, 1960, as reported to the U.S. Bureau of Mines, totaled 33,270,000 barrels—a decrease of 4 percent compared with August, 1959. Mill shipments totaled 36,387,000 barrels—a decrease of 1 percent compared with August, 1959. Stocks of 33,258,000 barrels of finished portland cement on hand were 18 percent more than those on hand August 31, 1959. Clinker production during August, 1960, totaled 29,297,000 barrels—a decrease of 6 percent compared with August, 1959.

PRODUCTION—One hundred and sixty-nine plants in 38 states and Puerto Rico reported a production of 33,270,000 barrels in August, 1960, compared with 34,800,000 barrels in August, 1959.

Production of clinker was 29,297,000 barrels, compared with 31,107,000 during the same month last year.

High-early-strength portland cement totaled 1,193,000 barrels—an increase of 8 percent, compared with August, 1959, production.

Prepared masonry cement production of 1,287,000 barrels decreased 11 percent from the August, 1959, production.

SHIPMENTS—Mill shipments of finished portland cement from 173 plants totaled 36,387,000 barrels, compared with 36,836,000 barrels in August, 1959.

Shipments were higher in 10 districts and lower in 13 districts. The greatest increases were in the Oregon-Washington and Colorado-Arizona-Utah-New Mexico districts.

Mill shipments of high-early-strength portland cement totaled 1,336,000 barrels—an increase of 2 percent over the 1,310,000 barrels shipped in August, 1959.

Mill shipments of prepared masonry cement totaled 1,557,000 barrels—a decrease of 0.3 percent from the 1,562,000 barrels shipped in August, 1959. Prepared masonry cements are shown in 376-lb. barrels although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 33,258,000 barrels of finished portland cement were on hand on August 31, 1960—an increase of 18 percent over the 28,102,000 barrels on hand August 31, 1959. Stocks of clinker on hand totaled 23,395,000 barrels—an increase of 46 percent over the 16,078,000 barrels on hand August 31, 1959.

FIRST EIGHT MONTHS OF 1960—For the January-August period, the production volume of finished cement amounted to 209,367,000 bbl., compared with 224,607,000 bbl. in the 1959 eight-month period. Total shipments for the first eight months of 1960 are reported at 205,655,000 bbl.; in the same period of 1959 total shipments were 225,319,000 bbl. (Shipment figures do not include finished cement used in the manufacture of prepared masonry cement, as follows: August, 1959—275,000 bbl.; January-August, 1959—1,977,000 bbl.; August, 1960—236,000 bbl.; January-August, 1960—1,820,000 bbl.) ●

Oklahoma Cement Co. Plant At Pryor Officially Dedicated

The official dedication of the new $8,000,000 Oklahoma Cement Company plant at Pryor, Okla., was held late in September. Although the plant actually went into production in July, the opening was delayed, pending the completion of all phases of the operation.

Construction was by the George A. Fuller Company from a basic design developed by A. J. Anderson, vice-president and general manager of Oklahoma Cement. The dry-process plant has an annual production capacity of over 1,000,000 bbl. from a 375-ft. rotary inclined kiln.

Cloyce K. Box is president of Oklahoma Cement. The board of directors, in addition to Mr. Box, is comprised of Mr. Anderson, Russel Hunt, K. S. Adams, H. A. Eddins, E. Fred Johnson, Jack Ware, George T. Weymouth, and O. S. Wyatt Jr.

Permanente's N.W. Division Cuts Cement Price 12½%

Fairbanks and Anchorage (Alaska) cement suppliers were recently advised by the Northwest Division of Permanente Cement Company of a 12½% cut in the price of cement ($1 per bbl.). The price slash was reported due to operating improvements of the company's storage and distributing facilities in the two cities. Also mentioned was increased efficiency in loading and shipping methods.

The announcement coincided with news that Permanente will build a $5,000,000 cement manufacturing plant at Sutton, about 65 miles north of Anchorage. Details of this 500,000-bbl. plant were published in September, 1960, PIT AND QUARRY on page 30.

Six TV closed-circuit cameras are being used at the new Oahu, Hawaii cement plant of Permanente Cement Company. If a loading chute jams anywhere in the manufacturing operation, the cameras will show the trouble instantly.

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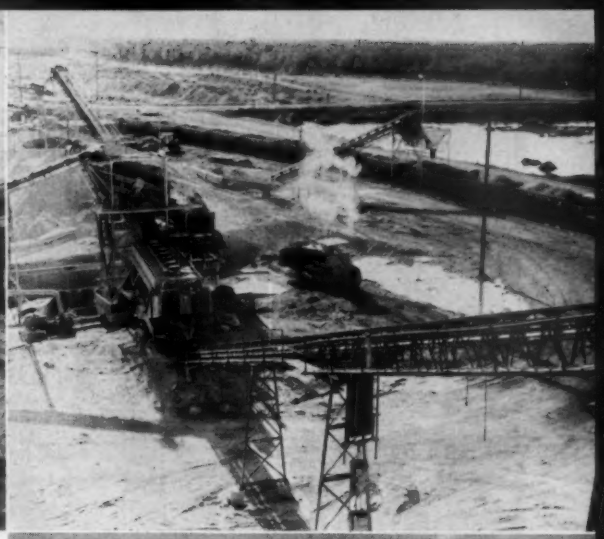

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go places and do things*

*Such as turning out a volume of specification concrete sand or two different gradations of sand at the same time. The Eagle Portable can do it because it has two Single Screw Fine Material Washer-Classifier-Dehydrators below a Water Scalping-Classifying Tank with automatic bleeder valves, multi-cell collecting-Blending flume and metering "splitter" gates, just like Eagle's stationary sand washing-classifying sections. Centralized push-button control.

And the Eagle Portable goes places—quickly made ready for travel—just hitch on a truck tractor—quickly set up at the operations site. Just wheel it in next to the screen. Now it's possible to make quick moves from one location to another in the same pit or locate in available pits near construction projects thus eliminating long material hauls. You can compete better—go where the business is with an Eagle Portable.

Eagle developed the Water Scalping-Classifying Tank—always ahead in engineering and service Eagle went a step farther and put it on wheels. Typical Eagle Portables of four different producers, in the States and Canada, are shown—a few of the many in use. Send for literature on Eagle Portable Sand Sections!

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—says J. O. ARCHIBALD
of Redwood City, California

The job was clearing 500 acres of salt marsh for crystallizing ponds. To quote, "We selected LUBRIPLATE No. 107 for track and general lubrication and LUBRIPLATE APG-140 for transmissions and final drives. During the entire job there was no replacements of track rollers nor any tie-ups of equipment due to parts replacement or breakage!"

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

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For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

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August Construction Totals Break Year-Long Trend—Exceed 1959 Figures

For the first time since July, 1959, construction contracts awarded have totaled more than the same month the prior year. Sharp gains in nonresidential building and heavy engineering sent the value of total construction contracts in August, 1960, to $3,295,217,000 — 7% above 1959, F. W. Dodge Corp. states.

After adjustment for normal seasonal factors, the Dodge Index of construction contracts dipped slightly to 276 in August (1947-49 = 100), but remained above the record 1959 yearly average of 265 for the third consecutive month. The index in July stood at 285 and in June at 272.

Nearly every major building type in the nonresidential building category scored impressive gains. Commercial building contracts were at an all-time high.

Heavy engineering contracts were up 20 percent over a year ago, and sharp increases were reported for highways and utility contracts. Dodge economists pointed out, however, that in both the nonresidential and heavy engineering categories the August, 1960, gains reflected, to some extent, a relatively weak year-earlier performance.

A summary of the latest figures follows:

	August, 1960	August, 1959	% Change
Nonresidential bldg.	$ 1,177,184,000	$ 961,101,000	+22%
Residential bldg.	1,432,682,000	1,551,224,000	— 8%
Heavy engineering	685,351,000	571,324,000	+20%
Total construction	$ 3,295,217,000	$ 3,083,649,000	+ 7%
	8 Mo. 1960	**8 Mo. 1959**	**% Change**
Nonresidential bldg.	$ 8,103,663,000	$ 7,841,631,000	+ 3%
Residential bldg.	10,347,310,000	12,115,843,000	—15%
Heavy engineering	5,948,228,000	5,616,435,000	+ 6%
Total construction	$24,399,201,000	$25,573,909,000	— 5%

Lime Sold and Used in July, 1960

Lime sold and used in July, 1960 (896,122 short tons), decreased compared to the previous month's output, according to reports by producers to the Bureau of Mines, U. S. Department of the Interior.

Decreases were noted in all major categories. Open-market lime constitutes approximately two-thirds of the total lime reported, and the remaining one-third of the total lime is captive tonnage.

Lime Sold and Used by Producers[1] in the United States, in Specified Periods of 1959-60, by Types and Major Uses in Short Tons

	June[2]	July		January-July	
	1960	1960	1959	1960	1959
By types:					
Quicklime	753,253	665,642	509,854	5,502,379	4,402,260
Hydrated lime	241,388	230,480	181,896	1,584,234	1,178,885
Total lime	994,641	896,122	691,750	7,086,613	5,581,145
By uses:					
Agricultural:					
Quicklime	3,811	3,618	3,261	34,126	41,111
Hydrated lime	8,943	5,810	5,463	68,389	74,810
Total	12,754	9,428	8,724	102,515	115,921
Construction:					
Quicklime	6,995	6,547	7,584	48,378	78,649
Hydrated lime	88,616	85,748	97,780	536,881	565,480
Total	95,611	92,295	105,364	585,259	644,129
Chemical and other industrial:					
Quicklime	586,618	532,117	393,171	4,103,287	2,906,013
Hydrated lime	143,829	138,922	78,653	978,964	538,595
Total	730,447	671,039	471,824	5,082,251	3,444,608
Refractory (dead-burned dolomite)	155,829	123,360	105,838	1,316,588	1,376,487

[1]The monthly canvass excludes the output of plants producing less than 10,000 tons a year. [2]Revised figures.

Ten California Concerns Form Rodeffer Industries In King Size Merger

In the Los Angeles area ten aggregate firms merged recently to form Rodeffer Industries, Inc., headed by E. O. Rodeffer.

The merger has resulted in a complex said to be the largest independent corporation engaged in the stone, sand, and ready-mix business in southern California. The following concerns were involved: Star Rock Products, Inc., in Santa Ana Canyon; Century Rock Company in the San Gabriel River deposits; Admixtures, Inc., of Pasadena; and seven plants of San Gabriel Ready-Mixt, which operates plants in Los Angeles, Inglewood, Pasadena, Sunland, El Monte, San Gabriel, and Santa Ana.

Lightweight Aggregate Plant Planned for Southern Calif.

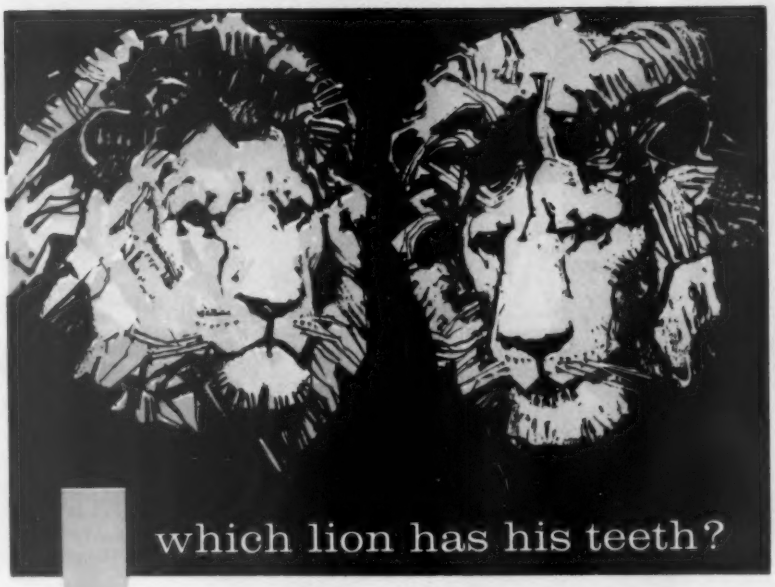
Susquehanna-Western, Inc. (Denver-based subsidiary of The Susquehanna Corporation, Chicago) will construct a lightweight concrete aggregate producing plant near Los Angeles. Construction will begin by the first of 1961 if feasibility studies continue favorably. The new facility will mark the firm's entry into the basic construction materials field.

This plant for the production of coated expanded shale, which will cost more than $1,000,000, is designed to provide for new process facilities as needed. It will serve both the Los Angeles and San Diego areas. The firm has leased shale deposits near San Clemente.

Florida Firm's Sand Plant To Have 7,500-T.P.D. Capacity

Construction of a sand plant near Clermont, Fla., has been announced by the management of Oakland Consolidated Corporation. Capacity of the installation, a Meckum-Floatex automatic sand classifying system, is 7,500 t.p.d.

A major feature of the plant is a 100-ft. high tower structure for gravity stockpiling more than 75,000 tons of finished sands. The 10-in. dredge pump is supplemented with an annular jet; both pump and jet are Meckum installations.



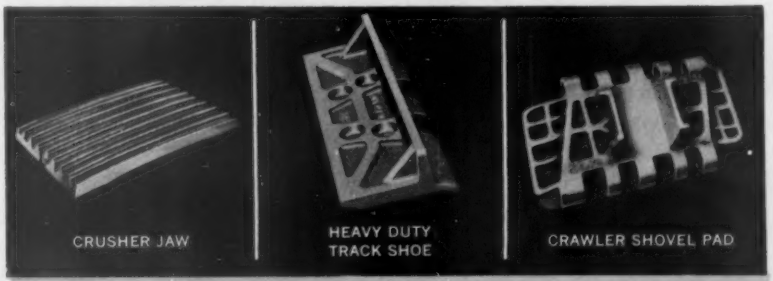
Both of these beasts have the heart of a lion. But, only one is feared in the jungle, for one is so old, he has lost his teeth.

Unfortunately, such is the case with replacement parts for crushers, tractors and shovels. Often parts produced by different manufacturers look alike, feel alike and weigh alike. But, when you put these parts to work, some, like the toothless lion, seem to chew with their gums. They do little work, and soon they are tired and worn out.

Why get caught with replacement parts that have no teeth, when you can play it safe with Columbia Armor-Tough replacement parts. Where rock meets metal, Columbia Armor-Tough parts are beefed up. Columbia manganese steel parts will do more work per dollar invested. Columbia guarantees it.

Next time order Columbia Armor-Tough replacement parts for crusher, shovel, tractor, and you too, will say, "Columbia out wears, out works all others."

Send for Columbia Field Report No. 504 telling how Columbia replacement parts outlived all others for De Atley and Overman, Idaho contractors.



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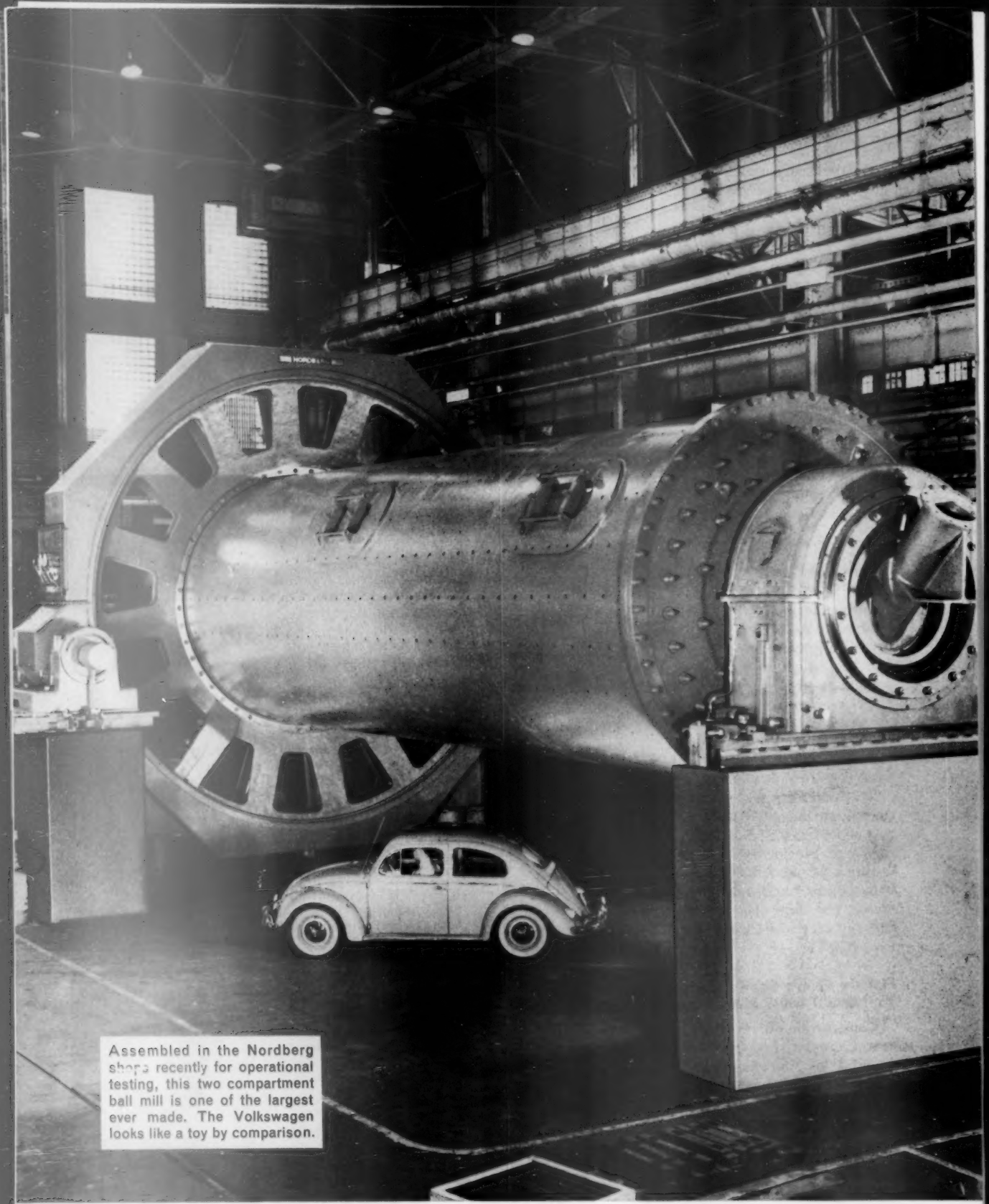
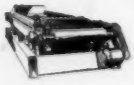


Assembled in the Nordberg shops recently for operational testing, this two compartment ball mill is one of the largest ever made. The Volkswagen looks like a toy by comparison.

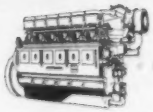
SYMONS PRIMARY GYRATORY CRUSHERS

SYMONS® CONE CRUSHERS


SYMONS VIBRATING SCREENS

SYMONS VIBRATING GRIZZLIES

ROTARY KILNS and COOLERS


NORDBERG ENGINES

NORDBERG sets the pace in LARGE GRINDING MILLS

to turn out greater tonnages at lower cost per ton

Nordberg has recently completed five of the largest grinding mills ever built for industrial service. These two compartment Nordberg ball mills (see opposite page) are 12 feet in diameter by 36 feet long, each powered by a 2500 hp synchronous motor, operating at 10% beyond rating. These mills are being installed in a new 5 million barrel per year wet process cement plant. The economies of using very large grinding mills to turn out greater tonnages at lower cost are important, however, to many other large ore and mineral reduction processes, as well.

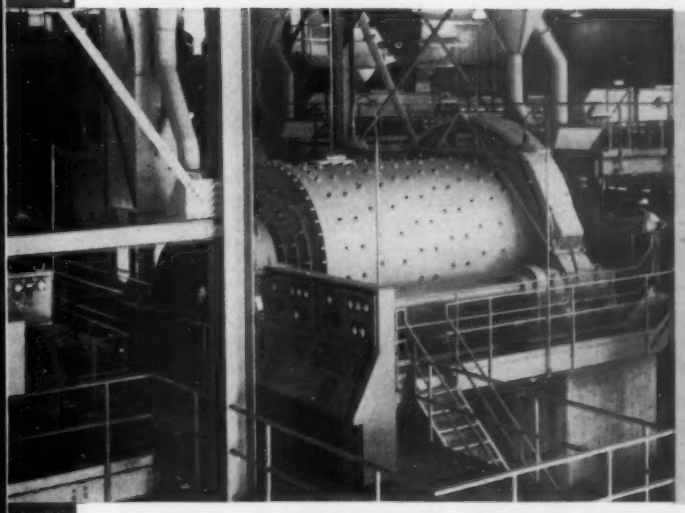
Consider some of these basic advantages:

1. *Lower construction and installation costs* . . . A single, large mill requires less floor space than several smaller ones, and only one foundation is required. Thus, construction costs are lowered and, in most cases, production is increased.

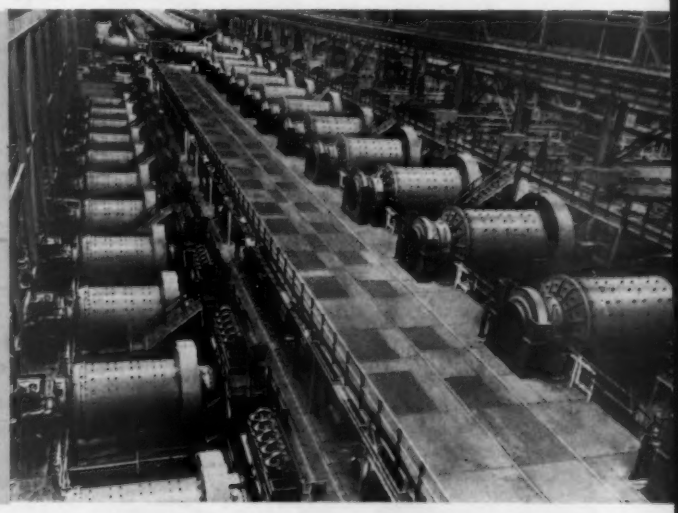
2. *Simpler automatic operation* . . . Where automatic operation is required, larger mills permit simpler handling with fewer controls. This lowers initial investment and minimizes installation and operational problems of automatic controls.

3. *Less maintenance* . . . Here, costs are again related directly to the number of mills installed. Fewer units mean less wearing parts and more dependable production. Exceptional savings may also be realized in replacement liners alone.

These are significant reasons behind the current trend toward larger grinding mills. But whether you require large or small grinding mills, you can count on the proven experience of Nordberg in furnishing the right grinding mill to meet your specific needs . . . including Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6 to 13 feet in diameter and up to 50 feet in length. *Write for further information.*



Shown here are two of five 11′ x 17′ Nordberg Ball Mills—three raw and two finish—installed in a midwest cement plant that has a capacity of 3,000,000 bbl. annually.



The largest iron ore mill installation in the world with 58 Nordberg Grinding Mills. This concentrator building houses 27, 10′ x 14′ rod mills and 27, 10′ x 14′ ball mills. Four Nordberg mills serve as standby units.

NORDBERG MANUFACTURING COMPANY, Milwaukee 1, Wis.

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James C. Gray Elected S.M.E. President for 1961 To Head A.I.M.E. Section

James C. Gray, administrative vice-president, raw materials, U. S. Steel Corporation, Pittsburgh, has been elected president (for 1961) of the Society of Mining Engineers, a constituent organization of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

Mr. Gray will succeed Dr. Arthur B. Cummins, Bound Brook, N.J., on February 28, 1961, during the annual meeting of A.I.M.E. in St. Louis.

For president-elect in 1961, pointing to his election as president of the Society of Mining Engineers in 1962 (following Mr. Gray's term), S.M.E. has named William E. Stephenson, Paoli, Pa., president of Allen-Sherman-Hoff-Pump Company.

Those who will also take office at the A.I.M.E. annual meeting, have been elected as follows:

Edward G. Fox, Washington, D. C., vice-president of S.M.E. for the Eastern Region (3 years). Mr. Fox is president of the Bituminous Coal Operators Association.

Dennis L. McElroy, Pittsburgh, executive vice-president, Consolidation Coal Co., S.M.E. director (3 years), representing the Coal Division of the society.

Raymond H. Feierabend, Port Sulphur, La., S.M.E. director (3 years), representing the Industrial Minerals Division. He is assistant vice-president of Freeport Sulphur Company.

James C. Gray

Wayne L. Dowdey, Birmingham, Ala., member of the board of directors (3 years), representing the Minerals Beneficiation Division. Mr. Dowdey is regional manager for the Birmingham and Pittsburgh districts of The Eimco Corporation.

Alfred D. Rood, New York City, S.M.E. director (3 years), representing the Mining and Exploration Division. He is assistant to the vice president, Andes Copper Mining Company and Chile Exploration Company, subsidiaries of The Anaconda Company.

Frederick S. Turneaure, Ann Arbor, Mich., professor of geology, University of Michigan, S.M.E. director (3 years), representing the Mining and Exploration Division.

Phoenix Cement Co. Plant Will Add Second Kiln

The new plant of Phoenix Cement Company, at Clarkdale, Ariz., which started operations less than a year ago, will have a second rotary kiln installed.

Construction is to begin early this fall, and the second kiln will become operative early in 1961.

Extra installed capacity in the raw- and finished-grinding departments will permit an increase in finished-cement output without any other major changes. As present capacity is 1,800,000 bbl. annually, this will increase output to 2,600,000 bbl.

The Clarkdale plant is currently fulfilling a contract with the U. S. Bureau of Reclamation to furnish 3,100,000 bbl. of cement over a 3-year period to Glen Canyon Dam, on the Colorado River.

The National Bituminous Concrete Association and the Agricultural and Mechanical College of Texas have announced the opening of the N.B.C.A. Research Office at the college campus at College Station, Tex.

TELSMITH *designed* for extreme flexibility with a wide variety of products

TELSMITH EQUIPMENT in this plant has two circuits: one with 24″ x 5′ Plate Feeder, 4′ x 10′ 2-deck Scalper, 4′ x 12′ 3-deck Vibro-King wet screen, 20″ x 15′ Twin Screw Classifier for concrete sand, 48″ x 30′ Sand Drag for mason sand. Gravel circuit has 10″ x 30″ Jaw Primary Crusher, 4′ x 10′ 1-deck Vibro-King dry sizing screen, 36-FC Gyrasphere Secondary Crusher, and a second 4′ x 12′ 3-deck Vibro-King wet screen.

This plant was tailor-made by Telsmith to produce aggregates for its owner's bituminous concrete plant, and for commercial use in the area. Products are Pennsylvania Highway Dept. specs Nos. 3A, 2A, 2B, 1B, Class A concrete sand, mason sand, and asphalt sand. In addition, minus 1″ and minus ½″ round gravel may be extracted and blended into final product either crushed or uncrushed when making crushed concrete specs. Plant capacity is 100-125 tph. Plant was designed and its Telsmith equipment supplied by A. R. Amos Co., Telsmith distributor, Philadelphia, Pa.

Send for Bulletin 266.

G-33-960

▲ Keystone Pavement & Construction Co. Lake Ariel, Pa. plant (general view).

◀ 24″ x 5′ Plate Feeder, 4′ x 10′ 2-deck dry Scalper, 10″ x 30″ Jaw Primary Crusher.

◀ 4′ x 10′ 1-deck Vibro-King sizer screen and 36-FC Gyrasphere Secondary Crusher.

▼ Two 4′ x 12′ 3-deck Vibro-King wet screens, 20″ x 15′ Twin Screw Classifier, 48″ x 30′ Sand Drag.

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Washington News Letter

(*Concluded from page* 11)

segments of the economy which were moving ahead, consumer buying of nondurables was steady, while purchasing of durable goods eased.

Furthermore, inventory accumulations had been tapering off, thereby eliminating the stimulus to sales provided by the large inventory build-up earlier in the year. The Commerce Department also agrees that housing construction has dropped significantly from a year ago. On the other hand, government buying continues to show upward tendencies, as do government payrolls.

The optimistic view is that reflected by the statement of the Sectary of the Treasury, Robert D. Anderson. In his view, the painful readjustment of 1960 is almost over. His analysis is based almost entirely on the inventory cycle. He, too, noted that the rate of inventory accumulation has moved downward very rapidly. He conceded that the downward movement may not be quite over.

However, he finds great cause for optimism in the fact that currently we are consuming our inventories more rapidly than they are being replaced. This is especially true of the inventories of steel. Accordingly, he concludes that steel inventories will have to be replaced and the pipelines filled in; and, as a necessary consequence, steel output and employment will rise.

In view of the fact that the steel industry is running at about one-half of its capacity, this is a sorely needed development. In addition, the optimists are assuming that there will be a significant rise in automobile sales in the forthcoming year. If this should happen, there will be, of course, a significant improvement in the steel situation.

Of special interest is the fact that all of these analyses are based on essentially the same body of economic data. The differences result from the fact that these data are given different weights by the various analysts. We just happen to be at a point in history when any one of them could be right because the indications have not yet pointed in any specific direction.

In connection with the prediction of business cycles, the National Bureau of Economic Research has been doing a very substantial amount of work in attempting to develop statistical measures by which downturns and upturns could be predicted. Members of this agency have finally come to rely on 21 indicators designed to summarize and interpret the complex interactions which make up a business cycle.

The indicators are divided into these groups: eight leading indicators which typically turn up and down before movements in general activities; eight roughly coincidental indicators which move together with the over-all economy; and five "laggers," which usually follow the developments in the general economy.

As of the moment, the situation is as follows: generally, the leading indicators, those which typically turn before turns in general business activities, have been showing a downward trend. However, the coincidental indicators, those which follow along with the developments in the economy, have not yet shown similar weakening tendencies.

Thus, there is still uncertainty as to where we stand. The outlook appears to be toward a further decline, although the business cycle is such a volatile thing that, hopefully, the optimists may turn out to be right.

Labor Developments

(*Concluded from page* 13)

gaining responsibilities, this court concluded that the employer knowingly and wilfully violated its policy and, therefore, should properly be subject to punitive damages. Accordingly, in addition to the $28,000 of direct damages the court awarded a further $50,000 to the union as punitive damages.

The aspect of punitive damages is certainly a controversial matter and is likely to be appealed to a higher court. Further developments will be watched with interest. Nevertheless, this decision shows a trend toward assessing monetary damages for violations of labor agreements.

Back Pay Liability In another case which was decided by a Federal Circuit Court, also sitting in Philadelphia, monetary liability was assessed not against the employer but against the union because of its illegal activities.

An employer who had a contract with a particular union in its principal plant opened another plant outside the geographical jurisdiction of that union. In this plant (non-union) the same product was made.

In an obvious effort to prevent the operation of the newly established plant, the union conducted a strike at the original plant and as a condition for settlement required the shutting down of the new plant. When this happened, the employer tried to enlist the help of the National Labor Relations Board by filing an unfair labor practice charge against the union. However, the administrative authorities of that Board did not take any action on the basis of the charge, and the employer therefore capitulated to the union demands, shutting the new plant and discharging the workers.

Thereafter, in a case before the National Labor Relations Board, that Board ordered the employer to re-employ the laid-off workers in its main facilities as vacancies occurred. In addition, it made the employer and the union jointly liable to make the laid-off employees whole for pay loss due to the plant shut-down.

When this case was appealed to the court, it upheld the first part of the order, namely, the requirement that the laid-off employees be hired in the main plant as soon as possible. But, with respect to the second provision, the court regarded the requirement that both the employer and the union should be jointly liable as unduly harsh on an employer who had resisted taking the illegal action, even to the extent of appealing to the Federal Government, where he was turned down.

Accordingly, the court changed the second part of the order. It required that the union be made fully liable in the first instance to make the laid-off employees whole for any loss of earnings. Only if the union failed to meet its full obligation could the employee then look to the employer for its fulfillment. The court argued that this placed the principal liability where it belonged: the laid off employees were reasonably certain of compensation even if the union defaulted.

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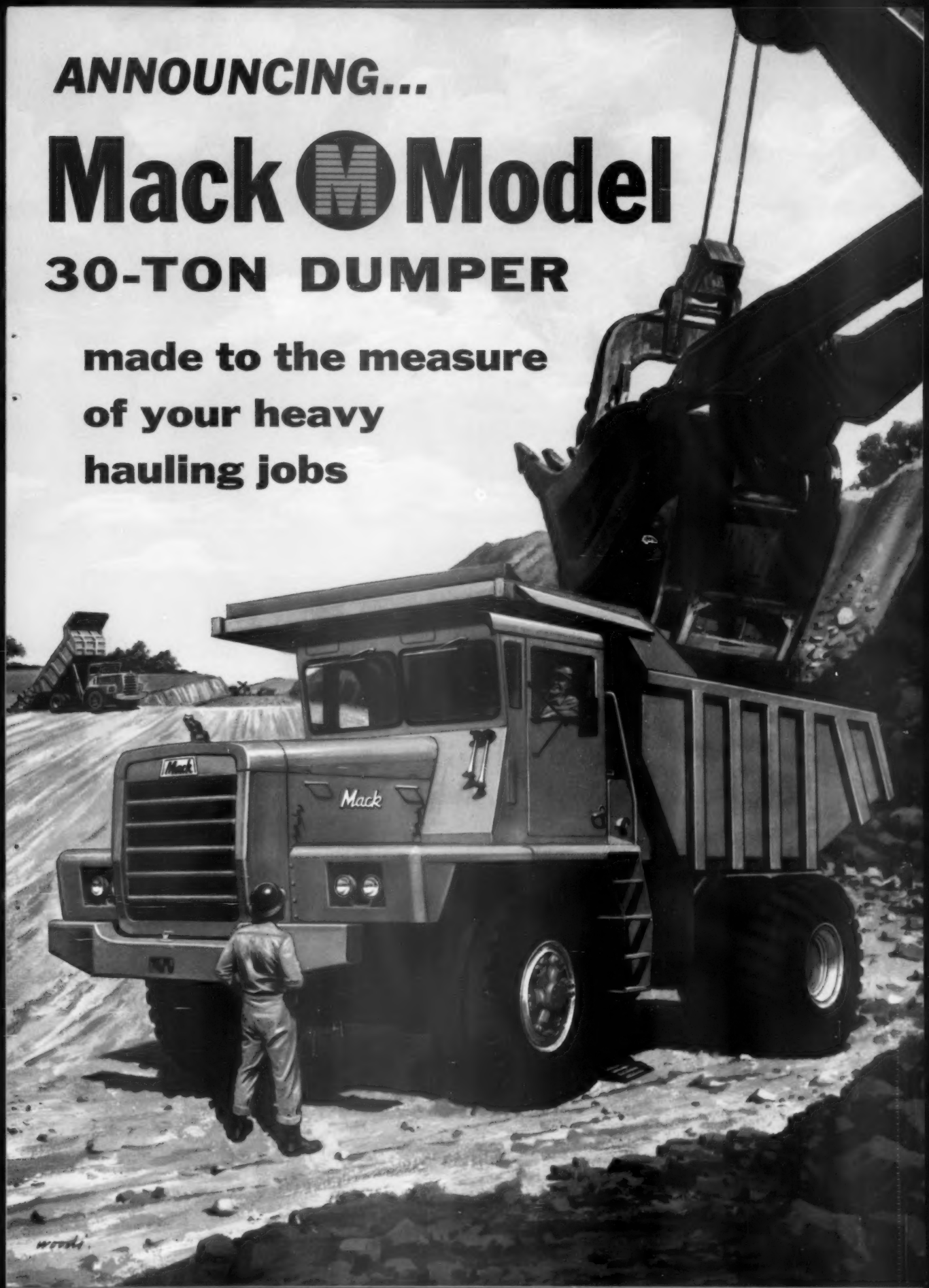
ANNOUNCING...
Mack Model
30-TON DUMPER
made to the measure
of your heavy
hauling jobs
Mack
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Mack M Model

30-TON DUMPER

with the components to make your hauling jobs more profitable

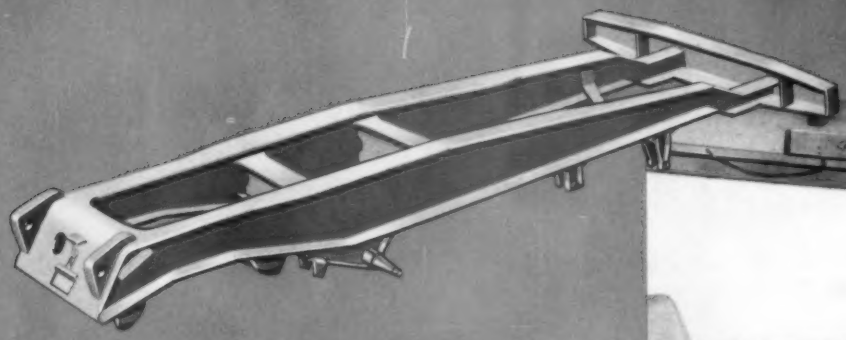
Made to master the heavy loads increasingly commonplace in the mining, quarrying and construction industries is Mack's new M-30X Model four-wheel end-dumper chassis.

This new addition to the Mack line of off-highway vehicles retains many of the time-proved features that have won Mack construction trucks worldwide fame for complete reliability and performance far surpassing lesser vehicles.

Add the many significant features exclusive to the Mack M Model . . . features that make the M-30X Model even more rugged, powerful, dependable and safe . . . and you have a vehicle sure to be first choice among those who must haul huge tonnages profitably.

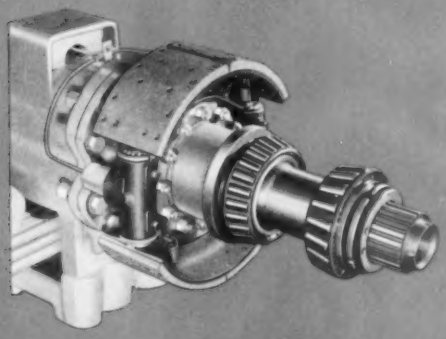
Heaviest-duty Mack rear axle, combining hypoid carrier with Planidrive, keeps M-30X hustling where others bog down. With Mack's patented Planidrive planetary gear drive in the rear axle hubs giving the dig-out torque needed for heavy off-highway hauling, the Mack Model M-30X boasts one of the strongest, longest-lived rear axles of any 4-wheel dumper in the field. Drive is through exclusive single-reduction hypoid Mack carrier, with planetary gears. Suspension is by extra long, extra broad semi-elliptic progressive-rate leaf springs with cam face slipper ends and radius rods.

New tubular front axle withstands heavier loadings. Steel tubing, seven inches in diameter, with walls ¾" thick is welded to cast ends to provide a reversed-elliott front axle that withstands the most punishing loads of quarrying, construction or mining.



Five-crossmember frame shrugs off jarring drop loads of big shovels. Typical of Mack off-highway truck construction practices, the frame of the M-30X Model is extra solid, extra strong. Five crossmembers, including integral front and rear bumpers, tie alloy steel fabricated I-beam main rails together to provide wrack-free support. Crossmembers are welded to web of main rails to prevent stress concentration in flanges. All corners are gusseted, with gussets welded to webs.

New massive, functional cab for extra strength, driver comfort. Completely new in appearance, the Mack M-30X cab is not only rugged, but completely functional. Efficient modern lines offer a reverse-slope windshield which lessens glare and reflections while reducing dirt and dust accumulation. Forward position permits heavier loading of new, larger-capacity setback front axle. Offset cab design provides maximum vision forward and behind for quicker spotting, quicker dumping, safer truck operation. Piano-hinged cab doors give extra strength, double cab venting gives extra comfort. Interior layout features easy accessibility and instrument visibility . . . lets driver concentrate on the job.



Unsurpassed stopping power—another M-30X feature. Shouldering a 30-ton payload demands safe, sure braking power. But the M Model's braking system more than meets the challenge. Front brakes are air, supplied by a 12 cu. ft./m. compressor, while rear brakes are air-hydraulic. Separate master cylinders at rear brakes provide safety factor in case of failure at either wheel. All brakes are internally expanding with simplified adjustment.

Mack Model M-30X

Built to extra-heavy-duty specifications

PAYLOADS: Rear dumper, 30 tons

WHEELBASE: 165"

PLATFORM LENGTH: 144"

OVER-ALL LENGTH: Front bumper to end of body, 323"

DIESEL ENGINES: 320 hp to 380 hp, six-cylinder diesel engines

COOLING SYSTEM: 1500 sq. in. frontal radiator, continuous finned, flat-tube

ELECTRICAL SYSTEM: 12-volt, 55-amp.

STARTING: Electrical, 24-volt

TRANSMISSIONS: Mack, selective, constant-mesh, 8 speeds forward, 2 reverse; optional Torqmatic transmission and Torqmatic brake; integral torque converter and planetary transmission selective shift

CLUTCH: Two-plate, air-assist with manual actuation

REAR AXLE: Single-reduction hypoid carrier, with final reduction Mack Planidrive planetary gear reduction within wheel hubs

FRONT AXLE: Mack, heavy-duty, tubular, welded cast ends

BRAKES: Front, air; rear, air-hydraulic; rear wheels with separate air and hydraulic cylinders to prevent complete loss of braking in event of failure at one wheel; 12 cu. ft. compressor

FRAME: Alloy steel, wide-flange I-beam, 137 section-modulus

STANDARD BODY: Heavy-duty 100,000 psi alloy steel

CAPACITY: Struck, 20 cu. yd.; heaped SAE rating, 25.5 cu. yd.

SPRINGS: Front, semi-elliptic, progressive rate; rear, semi-elliptic, progressive rate with cam face slipper ends and radius rods

WHEELS: Cast-spoked

TIRES: 18.00 x 25, 24-ply tubeless on 13.00 rims

STEERING: Hydraulic power-steering, 30′ turning radius

DUMP HOIST: Twin, double-acting, outboard mounted, two-section telescopic cylinder assembly, providing 60° dumping angle

POWER TAKEOFF: Mack, 50 hp

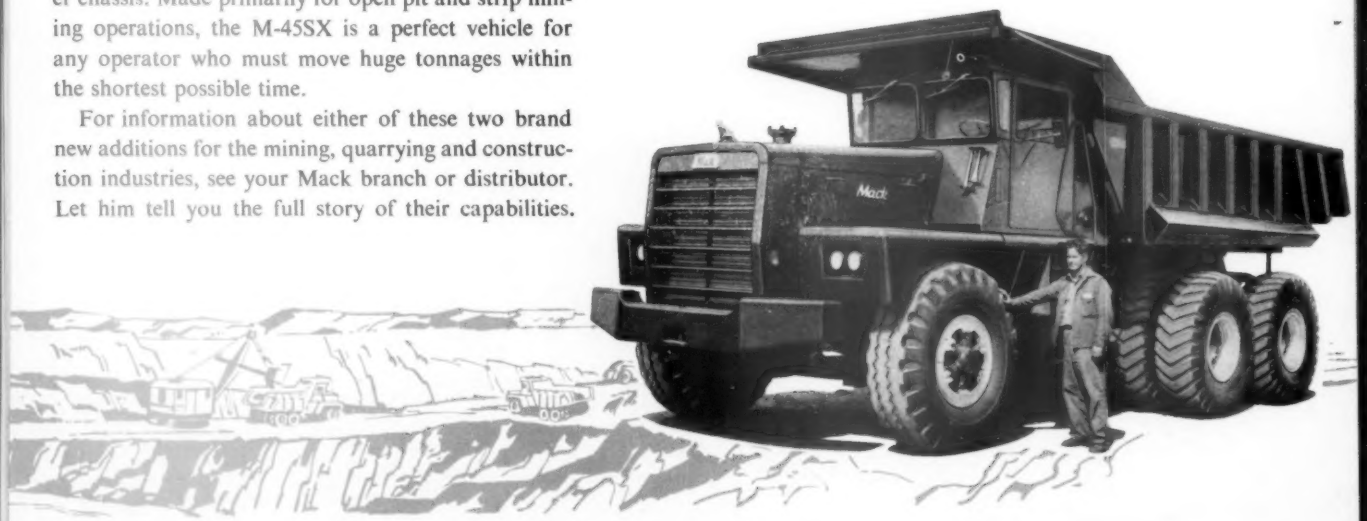
OPTIONS: Air-starting; rock ejectors

MACK FIRST NAME FOR **TRUCKS**

Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario

Mack M-45SX Model—six wheel, 45-ton mining-duty dumper. Unmatched capacity in the heavy-duty hauling field is offered in this companion to the M-30X—the remarkable Mack Model M-45SX six-wheel dumper chassis. Made primarily for open pit and strip mining operations, the M-45SX is a perfect vehicle for any operator who must move huge tonnages within the shortest possible time.

For information about either of these two brand new additions for the mining, quarrying and construction industries, see your Mack branch or distributor. Let him tell you the full story of their capabilities.



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W. H. Klein, R. H. B. Smith Retire after Long Service On Dragon Cement Staff

With a combined total of 101 years of service in the cement industry, W. H. Klein, executive vice-president, production, and R.H.B. Smith, executive vice-president, sales, of Dragon Cement Company, recently retired from their posts with this American-Marietta Company division.

W. H. Klein

R. H. B. Smith

Both Mr. Klein and Mr. Smith are widely known in their respective fields, and both have been active in supporting the work of industry and trade organizations in New England and the Middle Atlantic states.

Nonmetallic Minerals Producer Acquires Electronics Firm

G. & W. H. Corson, Inc., Plymouth Meeting (Pa.) producer of cement, crushed limestone, refractories, limestone, and dolomite, has acquired Livingston Electronic Corp. of Essex Fells, N. J., which will be a wholly-owned subsidiary.

Livingston Electronics has been a pioneer in high altitude packaging and hermetic sealing techniques, and currently supplies the electronics industry with a line of hermetically sealed tube sockets that have found wide acceptance in several missile programs. Sales amounted to $250,000 last year.

New York Trap Rock Corp. Wins Four Safety Awards

Four safety awards were presented to New York Trap Rock Corporation in June at a safety award banquet sponsored by the Greater Newburgh Chamber of Commerce and Associated Industries of New York, Inc.

The awards were: Five Year Award to the Tomkins Cove plant; 100% Awards to the West Nyack plant and the main office; and Certificate of Achievement.

Canadian J-M Management Underwrites Adult Education

In a recent issue of *Entre-Nous,* bilingual house publication of Canadian Johns-Manville Co., Ltd., Asbestos, Que., employees were alerted to the fact that they are eligible to attend night school classes at the local Arts and Trade School under a very attractive arrangement.

Canadian Johns-Manville assumes 65 percent of the tuition charge for "any employee who will have attended ⅔ of the classes." Instruction is given in a variety of subjects, including drawing, drafting (industrial), home construction, home wiring, machine shop practice, mathematics (applied to work), business financing, theory of the automobile engine, blue print reading, and many others.

Deal Completed in Sale Of Allentown Portland To National Gypsum Co.

Final arrangements have been completed for the acquisition of Allentown Portland Cement Company by the National Gypsum Company.

National thus adds three plants to its 60-plant mining and manufacturing network. Annual cement-making capacity of the firm will be increased to 16,500,000 bbl.

Allentown, now to be operated as a subsidiary of National, will have its own sales force, production units, and accounting and research facilities. It will continue to be known as the Allentown Portland Cement Company and maintain headquarters in Allentown, Pa.

Herndon Concern Acquired By Wyoming Construction

Herndon Rock Products Company, Herndon, Calif., an affiliate of Stewart & Nuss, of Fresno, was acquired recently by the Wyoming Construction Company, in the transaction whereby Wyoming acquired Stewart & Nuss.

Wyoming Construction Company is affiliated with the Mel Dar Corporation, and the Monolith Portland Cement group in Los Angeles.

Smart Elected President of A.I.M.E. Metallurgy Society

John S. Smart Jr., general sales manager of the American Smelting and Refining Company, has been elected president of the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers for 1961.

Mr. Smart will take office on February 28, 1961, during the annual meeting of A.I.M.E., which will be held in St. Louis, Mo. He will succeed Dr. Carleton C. Long, Monaca, Pa.

Chicago will be the site of the 12th annual Plant Maintenance and Engineering Show, which will run from January 23 through 26, 1961, at the International Amphitheatre. The conference is scheduled for January 23 through 25. Morning sessions will be held at the Amphitheatre, and evening sessions at the Palmer House.

World-wide Cement News

Self-Unloading Vessels Used to Transport Cement

Nordstroms Linbanor, Stockholm, Sweden, is installing self-unloading equipment in a 2,500-ton vessel for transporting cement for the Finnish cement manufacturing company, Pargas Kalkbergs AB. A similar vessel is under construction at a Swedish yard for Skanska Cement AB, Malmo; and a 1,100-ton cement ship is being built in Norway.

The transport system, developed by Nordstroms Linbanor in collaboration with Skanska, also uses special loading and unloading devices in the harbors.

Skanska Cement AB's fleet is comprised of five ships, including the unit under construction.

Taiwan Resumes Cement Export After Four-Month Ban

Export of cement from Taiwan, banned by the Nationalist China Government for nearly four months, was resumed in September. Cement shortages resulting from increased domestic demand caused the ban.

Domestic supply now has increased, aided by the arrival of imports, the completion of post-flood reconstruction projects, and the inauguration of the new Asia Cement Company plant, which began operations in July.

Fiji Industries Ltd. Formed To Produce Cement for Area

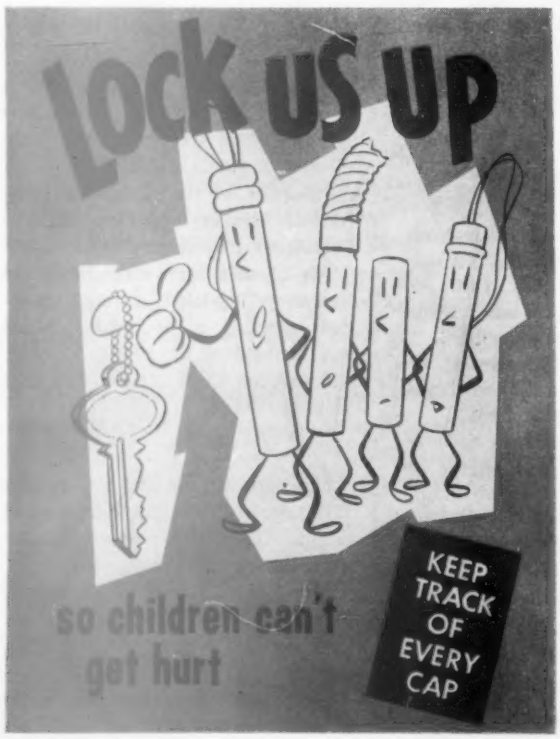
Fiji Industries Ltd. has been formed in Fiji for the manufacture of cement for local materials and for the sale of the product both domestically and for export. Issued capital totals £250,000 (Australian); authorized capital is £500,000,000. (Exchange rate, 225 American cents.)

The Fijian Government has provided a plant site and a 50-year lease for obtaining raw materials. Equipment will be transported to Fiji from Australia.

Blasting Cap Dangers Cited by Explosives Makers

Despite a slight reduction in 1959, blasting cap accidents continue to be a serious safety problem in this country. The Institute of Makers of Explosives, backed by the schools, Boy Scout troops, law enforcement agencies, the Y.M.C.A., and other organizations, has done an outstanding piece of work in furnishing safety education materials to the public; but it is believed that individual industries should make a more intensive effort to prevent caps from falling into the hands of children.

The accompanying poster (furnished by I.M.E.) is designed for the use of companies in which certain individuals are responsible for the storage of explosives. It is suggested that management place the posters where they will be seen by blasting supervisors and other personnel involved in blasting operations.



In a tabulation of blasting cap accidents unfavorable showings were made in 1959 in Pennsylvania and Texas. Pennsylvania had 8 accidents (down from 26 in 1958) and Texas had 18. The total number for the 45 states covered was 128.

East African Cement Depot In Operation Between Seaports

The new cement silo and bagging plant at Dar es Salaam, Tanganyika, East Africa, recently underwent trial operations in conjunction with the bulk cement carrier, *Southern Baobab*. The carrier will transport cement from Mombasa, Kenya, to Dar es Salaam and Port Louis, Mauritius, where similar silos and facilities have been constructed.

The three silos at Dar es Salaam were designed for a total capacity of 4,000 tons of bulk cement.

Korea's Cement Shortage, High Demand Hike Price

It is estimated that cement consumption in Korea is increasing at the rate of 100,000 tons annually. If this trend continues, Korea's cement requirements will rise to 1,000,000 tons a year by 1963.

To achieve self-sufficiency in cement, Korea needs a new plant with a capacity of 200,000 tons a year during the next three years. At present, the nation's cement production is estimated at 400,000 tons.

Cement prices have been rising on the Korean market, but officials of the Commerce-Industry Ministry expect them to come down before year-end, when about $1.57 million worth of imported cement, purchased under the 1959-60 I.C.A. import program, reaches the Korean market. The unusual price rise was attributed to a short supply.

KOEHRING HEAVY DUTY

KOEHRING *MEANS* HEAVY DUTY

The words "HEAVY DUTY" are an important part of the Koehring trademark . . . have been for years. And there's a mighty good reason: Koehring excavators have proved through millions of hours of service that you can count on them to outproduce and outlast other makes even under the most severe digging conditions. They're *heavy duty* through and through.

Take the front end, for instance. The big tough rock boom, double dipper sticks, rugged chain crowd, and long wearing dipper give you real *heavy duty* dependability at the business end. Or take the crawlers. Each individual shoe actually is strong enough to support the *entire machine,* plus its rated load. Or take the main machinery. Shafts are kept in perfect alignment because side stands are line bored in place as a unit.

Yes, Koehring *means* Heavy Duty. That's why you can *expect* more from a Koehring excavator . . . why you *get* more from a Koehring.

K18

MORE WORK CAPACITY...

MORE PROFIT PER DOLLAR INVESTED

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

Permanent Headquarters For all Kaiser Divisions Now in New Center

Permanente Cement Company, Kaiser Gypsum Company, Inc., and the Kaiser Sand and Gravel Division of Kaiser Industries, Corp., have moved their headquarters into the new Kaiser Center in Oakland, Calif. For the first time, all 60 Kaiser companies have their headquarters under one roof.

The Kaiser Center is the largest office building west of Chicago. Approximately 80 percent of all building materials used in the construction of the Center are produced by Kaiser companies, or are products stemming from Kaiser-processed raw materials. Materials used included: 60,000 cu. yd. of concrete; 250,000 sq. yd. of gypsum lath and plaster; 98,000 tons of sand, gravel, dolomite and aggregates; about 8,000 tons of steel, and approximately 2,000,000 lb. of aluminum.

The newly completed 28-story Kaiser Center in downtown Oakland, Calif., is now headquarters for the 60 affiliated companies making up Kaiser Industries Corporation. The 390-ft. high building is made almost entirely of products and raw materials produced by the various Kaiser companies.

The 28-story building has 1,700,000 sq. ft. of floor space, and furnishes working space for 2,500 people now. Its capacity population is 4,000 persons. Robert E. McKee General Contractor Incorporated coordinated the 236 contractors, subcontractors, and suppliers involved.

Industry Personalities

E. R. Stevens

A. M. Ehret Jr.

EDWARD R. STEVENS has been elected president of Baldwin-Ehret-Hill, Incorporated, manufacturer of mineral wool and acoustical products, according to an announcement from ALVIN M. EHRET JR., newly elected chairman of the board.

Mr. Ehret succeeds WILLIAM H. HILL, who resigned from that post to give full time to the company's growing foreign operations, which currently include plans for the formation of a European subsidiary.

Mr. Stevens joined Baldwin-Hill Company in 1937 in the capacity of vice-president in charge of sales. In 1955 he became executive vice-president, and, since the merger of Baldwin-Hill with the Ehret Magnesia Manufacturing Company in August, 1959, he has served in that post.

Formerly president of the Ehret Magnesia Manufacturing Company, Mr. Ehret continued as president of Baldwin-Ehret-Hill after the merger.

The promotion of PAUL R. BARTRAM to the position of manager of the National Gypsum Company's lime plant in York, Pa., has been announced. He replaces WILLIAM W. WALLACE who recently retired after more than 14 years with the company.

Mr. Bartram began his career with National Gypsum in 1950 as plant engineer at the company's Kimballton, Va., lime installation. In 1953 he was advanced to the position of mill superintendent at the Bellefonte, Pa., lime plant, his most recent post.

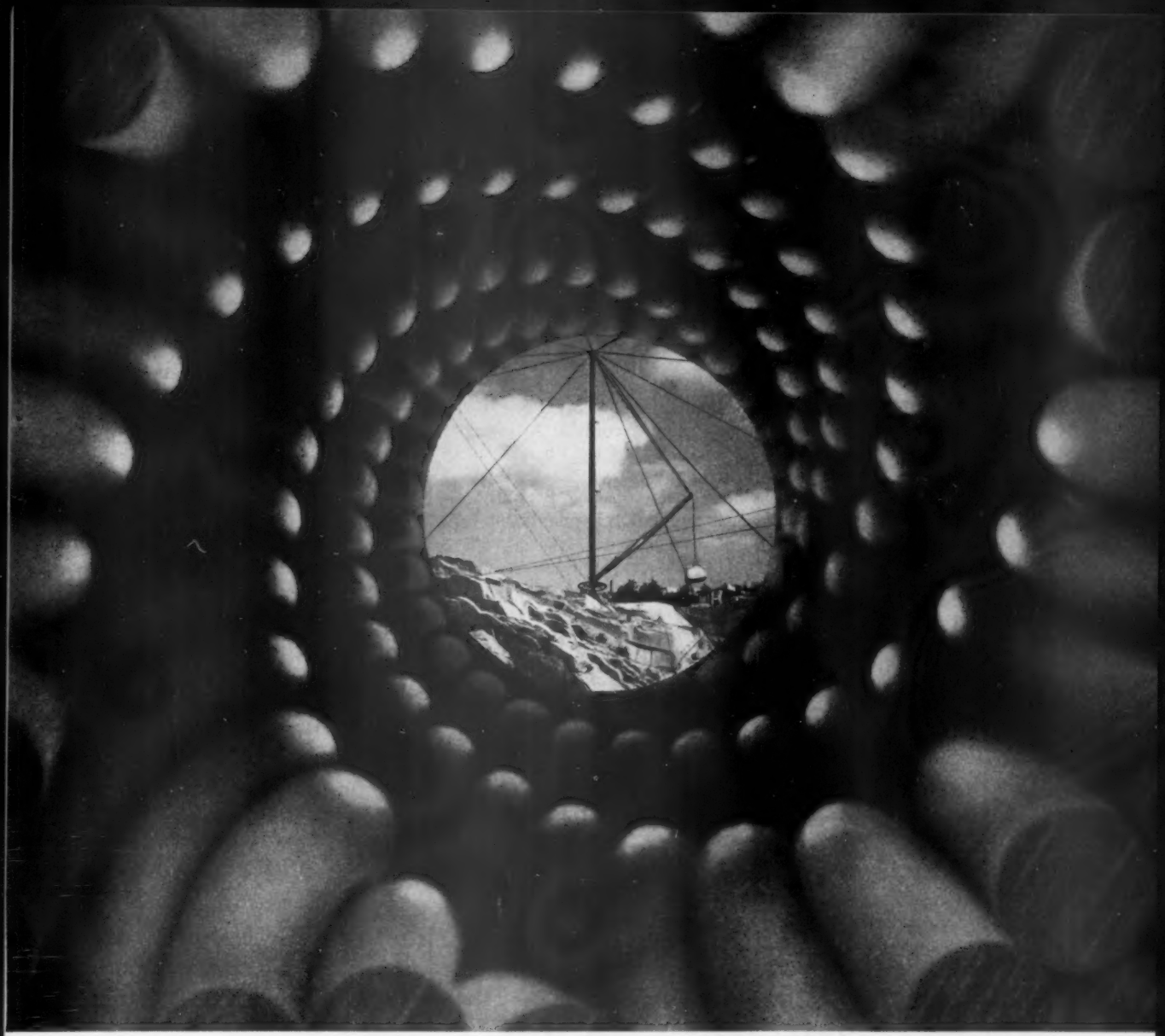
R. A. Raggio

ROBERT A. RAGGIO has been appointed treasurer of Universal Atlas Cement (Division of U. S. Steel Corp.). He succeeds CLARENCE A. KEELEY, who retired on July 31 after 40 years of service with the firm. Mr. Raggio started with Universal Atlas in 1926 and became assistant treasurer in 1957.

ARTHUR T. HERSEY, director of technical service for Alpha Portland Cement Co., Easton, Pa., has been elected to the Philadelphia district council of the American Society for Testing Materials.

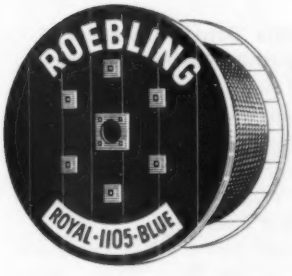
As a district councilor, Mr. Hersey will take part in the general management of A.S.T.M. activities in the Philadelphia district.

(For additional items, see p. 43.)



ROEBLING ROYAL BLUE WIRE ROPE

WE PUT A LOT OF WORK INTO IT—YOU GET A LOT OF WORK OUT OF IT



This happens to be the inside view of Roebling Royal Blue — its core has been removed to show the uniformity and symmetry of the rope structure. You see how concerned we are with internal security.

We have to be. To make sure that Royal Blue will live up to the day-to-day demands made upon it. High stresses and unavoidable overloads, abrasion, fatigue, impact, crushing, sheave pressures and abusive drum-winding, to name the major ones.

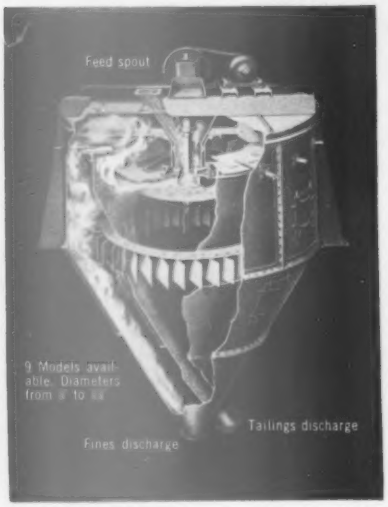
Royal Blue goes through many inspections and tests—both internal and external —before reporting to work. This way we're sure that the rope we build will do what we sell it to do. These quality-control measures are your assurance that Royal Blue is made to save you money — anyway you look at it.

For details about hard-working Royal Blue, ask your wire rope distributor or write Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

In Cement and Aggregates the Word for Air Separation is "Sturtevant"



in cement . . .

Sturtevant Air Separators make possible highly efficient closed-circuit systems. Large circulating loads increase output, eliminate overgrinding. Ball and lining life lengthens, power costs are lowered. Top quality cement results from precise control of finenesses. Standard 16 ft. Sturtevants deliver raw fines up to 70 tph, finished fines up to 260 bph.

in aggregates . . .

Sturtevant Air Separators classify sand without water, clean sand by de-dusting it. Pre-classification by air can also increase screening production by removing screen-blinding fines. In blending operations, Sturtevants select desired fines from grinder throughput. This graded product is then used to overcome fineness modulus deficiencies.

Send for Air Separator Bulletin No. 087.

STURTEVANT
MILL COMPANY
104 Clayton St., Boston, Mass.
Crushers • Grinders • Micron-Grinders • Separators
Blenders • Granulators • Conveyors • Elevators
Enter 42 on card, page 197

Safety Seat Belt Drive Promoted by Management Of Phoenix Cement Co.

Phoenix Cement Company, one of the nation's newest cement producers, began producing cement at Clarkdale, Ariz., late in 1959.

Since the start of production, heavy emphasis has been placed on the prevention of accidents. Safety education and mechanical safeguards have paid off, so that the new concern and its 162 employees have already established one of the finest safety records in Arizona.

One phase of the Phoenix safety program, which typifies the detailed efforts being made in over-all accident prevention is the company's seat belt program. Management—from President Ray R. Adams down through Don L. Rogers, personnel director, and Don Hoover, fleet safety advisor—soon became convinced that the National Safety Council's figures on seat belts were impressive. These data showed that a person involved in a driving accident while wearing a seat belt was 60 percent less likely to be injured, and 50 percent less likely to be killed. The statistics pointed up an important facet of the safety program.

Phoenix Cement's concern for safety was implemented by a month-long safety belt campaign. In carrying out this campaign, management called in the local chapter of the National Safety Council, which aided in selling the seat belt idea to all company personnel. As a result, the firm ordered the installation of the belts in every one of the company's 17 trucks and 14 company-owned automobiles. An intensive seat belt indoctrination course among all employees had striking results, too. Many of the workers in the Clarkdale plant and the main offices in Phoenix bought belts for their personal and family vehicles on the strength of the safety arguments presented. They actually purchased 336 seat belts and 37 children's harnesses.

The belts are of the approved type, woven of nylon and equipped with positive metal-to-metal clasps and fingertip releases.

In recognition of the success of the program, Herb Lindner, vice-president of the Maricopa County Chapter of the National Safety Council, recently presented Mr. Adams with a special Green Cross Award. The company is the first in Arizona to receive this award for installing the safety belts. At the award ceremony, Arizona's governor, the Honorable Paul Fannin, was also present.

Ray R. Adams, Phoenix Cement Company's president, receives congratulations from Paul Fannin, governor of Arizona, after having been presented with a special safety belt award by the Maricopa County Chapter of the National Safety Council. At the right is Herb Lindner, who made the presentation.

New Plant Completed For Marble-Wite Dolomite

A $150,000 mill and quarry for processing white dolomite roof rock and white terrazzo chips has been constructed in the Lucern Valley of California by Marble-Wite Dolomite, Inc., San Bernardino. Production of white rock in bags, landscape white rock, fireplace and facing rock, fines, and powders has begun.

The firm's deposit of dolomite is estimated at 60,000,000 tons. Donald H. Hall is general manager and quarry foreman.

Ready-Mix Gravel Complex Developed by Idaho Firm

Idaho Concrete Pipe Company is constructing a sand and gravel processing plant and a ready-mix plant near Boise, Idaho. The new facility will be called Concrete Ready Mix Company.

Sand and gravel will be processed at a site on the Boise River. Other units will include an automatic batch plant, storage bins, and a fleet of new half-cab 8-cu. yd. transit mixers.

(*Industry Personalities, from p. 40.*)

Three changes have been announced in the furnace products division of Basic, Inc.

GEORGE J. PEER has been named sales manager, furnace products, in Cleveland. He will be responsible for sales of refractory and lime products to the steel industry. This is a newly created position.

GEORGE W. EDWARDS, formerly central district sales manager, will succeed Mr. Peer as sales manager for the Midwestern district.

D. BEDELL BAXTER succeeds Mr. Edwards as sales manager of the central district in Cleveland.

PHILIP H. HARRIS, director of research and development, Riverside Cement Company, Los Angeles, Calif., has been named chairman of the new research and development committee of the parent organization, the American Cement Corporation. Representatives on the committee from other American Cement divisions are:

H. L. VANDERWERP, technical director of Peerless; F. G. ALICH, chief chemist at Hercules; and R. F. LOWE, chief chemist, Phoenix.

DR. ALLEN T. COLE, Lakeland, Fla., minerals consultant, has been appointed property manager for the Florida and Tennessee phosphate operations of International Minerals and Chemical Corporation.

Assisting Dr. Cole will be W. A. STRINGFELLOW, reserves development engineer; A. J. HAHN, land reclamation engineer; and CECIL STANGE, property superintendent. J. R. HALL will head the reserves acquisition program in the Tennessee field.

Two promotions have been announced on the staff of Hercules Cement company, a division of American Cement Corporation.

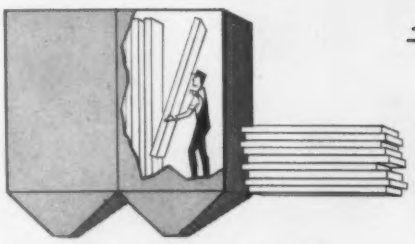
HERBERT G. SOBELTON has been named vice-president, administration, and JOHN J. MCGONAGLE is the new sales manager of the firm.

Mr. Sobelton was manager, administrative services, in Philadelphia.

Mr. McGonagle was formely assistant to the vice-president, sales.

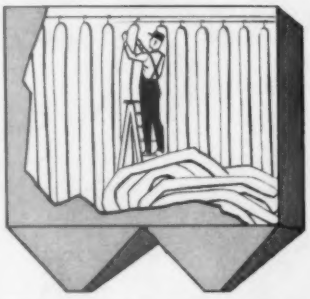
SINCE 1876 SLY

SLY DUST FILTERS For ACCESSIBILITY



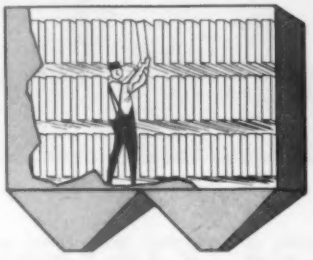
1900's
SLY DUST ARRESTER

Every cloth screen from the end of the arrester had to be removed to reach the faulty screen.



1930's
SLY TUBE-TYPE FILTER

To replace a tube required at least partial disassembly of every other tube in the way.



TODAY
NEW SLY
"ROLL-CLEAN"
DYNACLONE®

Any filter bag is easily accessible and can be replaced without need for removing others.

NEW SLY DYNACLONE PROVIDES FASTEST, EASIEST BAG CHANGING

Whether you change one bag, or the entire filter, you do it in less time with the Dynaclone. Quick replacement of individual bags eliminates the need for costly rebagging should only a few be worn. Complete change is also fastest . . . the Dynaclone has only one half as many bags as other filters with the same cloth area. In addition . .

New "Resist-O-Wear" bags offer 200 to 300% more bag life.

The Dynaclone operates continuously. It provides complete dust suppression through constant suction.

The Dynaclone is automatically self-cleaning by reverse air. A single exhaust fan provides *both* suction for dust collection and air for bag cleaning. No auxiliary blowers required.

And the Dynaclone provides 20 to 40% more cloth in a given space than other makes of dust filters.

The Dynaclone has been proved in more than 1,000 installations. Investigate its advantages on your applications . . .

SEND FOR 36-PAGE CATALOG 104

THE W. W. SLY MANUFACTURING CO.

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Enter 43 on card, page 197

NEW ROCK LOADING TEAM

Hauler: 13-ton Michigan Tractor Wagon
Loader: 2¾ yd Michigan Tractor Shovel
Output: 2,400 tons daily on 2-mile cycle

Four years ago, the Fort Scott Hydraulic Cement Company, Fort Scott, Kansas began a program to replace their four crawler-loaders and two 10-ton tandem-axle dump trucks with the most modern equipment available.

The program was completed when a 13-ton rear-dump Michigan Tractor Wagon went on the job a year ago. Its addition gave Fort Scott, one of the nation's three major natural cement producers, an all Michigan fleet. The Wagon teams with a 2¾ yd Model 175A Michigan Tractor Shovel in the rock pit. Three other 2¾ yd Michigan Tractor Shovels handle the crushed rock, coal, and clinkers in this 4,500 barrel-a-day natural cement plant.

Tractor Wagon hauls 120 tons per hour

It's the heavy rock loading and hauling operation that Mr. Pat Thomas, president of the 92-year-old firm, points to as being the best example of how the Michigan machines have improved job efficiency.

Shot Florentine limestone is currently being loaded out of the far end of a pit 90 feet wide and 5,000 to 6,000 feet long. This makes the average haul cycle, between pit and crusher, about two miles.

The 162 hp Tractor Wagon's stability and speed of up to 31 mph is a prime production factor in the mile long *uphill* run from pit to crusher. With torque converter and full power shift, power and speed are instantly adjusted to match the load demand.

On two 10-hour shifts, the Tractor Wagon, sideboarded to meet rated ca-

Michigan 162 hp Tractor Wagon, with torque converter and power shift providing top speed, barrels uphill to plant.

With hydraulic rear dump, Michigan unloads fast. Quick-interchange feature, Wagon for 10½ yd Scraper, provides added versatility.

In spare time, 13 ton Tractor Wagon takes crushed stone from hopper to stockpile.

BOOSTS PRODUCTION 25%

pacity, and the highly-maneuverable 2¼ yd Tractor Shovel will load out an average 2,400 tons of rock . . . rock which weighs, when loose, approximately 2,500 lbs per cu yd.

2 Michigans outwork 3 units formerly used

Production in the rock pit has risen 25% since the Tractor Shovel replaced a crawler rig with similar bucket capacity, and the Tractor Wagon took over the job formerly handled by two 10-ton dump trucks.

When maximum production from the crusher is not a factor, the Tractor Wagon is taken off the shot rock haul and used by itself to build up the crushed rock stockpile, an operation previously handled by two to four random-sized dump trucks.

Compaction has reduced haul road maintenance

An added advantage, according to Mr. Thomas, is the Michigans' compacting action on the haul roads. The 31,500 lb (plus load) Model 110 Tractor Wagon and the 29,000 lb Tractor Shovels have reduced maintenance and actually improved haul road conditions as they travel between pit and plant.

Upkeep "phenomenally small," says president

"With all five of the Michigans working constantly with heavy loads and over sharp rock and abrasive cinders, *we have spent less than $2100 on overhauls, parts, tires and labor during the past three years,*" says Mr. Thomas. "I think this figure is extremely low considering what a machine goes through in a cement plant operation of this type. We have had virtually no downtime."

If you're hauling bulky materials off the highway, perhaps a Michigan Tractor Wagon could increase your production, too. When you pair it with one of the eight Michigan Tractor Shovel models (up to 6 cu yds), you've got a team that can't be beat. Let us demonmonstrate. Just call. There's no obligation, of course.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK® EQUIPMENT

2479 Pipestone Road
Benton Harbor 13, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

Enter 44 on card, page 197

Hoped for: increased loading efficiency
Received: that PLUS 4 *other production jobs*

Result: Michigan replaces 6 machines

By purchasing a big Michigan Tractor Shovel, A. Cope & Sons Ltd, Hamilton, Ontario, naturally could expect *some* production increase over smaller units previously used in their quarry stockpile loading operation.

What they didn't expect was the dramatic increase they got—over 3 to 1. Nor did they expect the variety of other production jobs the Michigan could do *in addition* to its regular loading chores. And, these were jobs that *had been* considered strictly in the realm of crawler dozers and swing shovels.

Daily output: 4,500 tons

In the loading operation alone, the big Model 275A did so well it replaced all three loaders formerly used—a 2½ yd crawler, a 1½ yd swing shovel, and a 2¾ yd

Tractor Shovel. With its 22,000 lb lift capacity and 4½ yd bucket, the power-shift Michigan loads a 12 yd truck in 60 to 70 seconds. In a typical "peak period" 10 hour

day, its output totals up to 4,500 tons of crushed stone. Unit services even the smallest trucks—each one taking only one pass, 20 to 30 seconds, to load.

"One of the Michigan's biggest advantages," says George Eskine, Quarry Supt, "is that it can load from all our stockpiles with a minimum of lost time for travel. Crawler immobility was of course one of the principal reasons we previously had to use three loading units."

In non-peak periods, the mobile 28 mph Michigan

also does many jobs which formerly required at least stand-by assignment of other machines. For example . . .

Builds stockpiles

Stockpiles are located against the face of an old blast area. Trucks, from the crusher, dump at the top. The Michigan Tractor Shovel "dozes" material onto the stockpile, replacing in this job the regular services of a medium-sized crawler-dozer.

Strips overburden

Formerly, a couple times a year, one or two 10-yd scrapers and operators were hired to strip the clayey

topsoil overburden. Now, the Michigan, equipped with bucket teeth, strips and loads this material into company-owned haul units.

Cleans up, loads rock

The Model 275A regularly cleans up after blast and around the 2½ yd swing shovel. This task, too, was formerly handled by a crawler-dozer. Occasionally, also, the 4½ yd Michigan takes over for the rock shovel. Here, Michigan capacity and maneuverability actually speed the operation. In three quick passes, the Michigan loads an 18-ton rock-hauler.

Mobility and two-way radio key to multi-job production

Right from the start, the Michigan's capacity to do more than just load trucks was evident. Supt Eskine reasoned that with a two-way radio, assignment of tasks would be handled with maximum efficiency. Now, in a matter of seconds, the Michigan can be on its way from stockpile loading to shot rock loading or any one of the five other jobs it normally handles.

The Model 275A, as well as three 17,000 lb lift capacity Model 175A's which the firm operates in other divisions, has helped A. Cope & Sons increase production while cutting overall machinery investment. Perhaps a Michigan Tractor Shovel could do the same for you. Call us for a no-obligation demonstration.

Michigan is a registered trademark of

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2479 Pipestone Road
Benton Harbor 31, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

New concept in speed loading is demonstrated by the Koehring 205 Skooper, which has a front-end loader capacity of 2 cu. yd. Its combination of 7-ft. level crowd and 360-degree swing results in fast, "stand-still" loading.

New Kwik-Mix front-end loader for the Hi-Lifter is a 1-cu. yd. loader which rapidly converts to a fork lift. Entire operating mechanism pivots ahead of the operator. The new machine has a 5-ft. reach and an 8½-ft. dumping height.

New Front-End Loaders Among 40 Machines Exhibited at Koehring Show

At the 1960 Koehring Company's Construction Equipment Show held at the firm's proving grounds near Waukesha, Wis., September 19-23, some 40 construction machines built by its seven construction machinery divisions were put through their paces for contractors, distributors, and other equipment users.

Business was tough last year due to wide fluctuations in construction volume, J. R. Steelman, Koehring president, told the group in his opening address. This fluctuation has held down profits, and machinery sales have also reflected it. To combat this condition, said Mr. Steelman, Koehring has developed more effective equipment as one method of increasing sales. Machinery has also been designed which can serve either specific or general purposes on the job.

One of the versatile machines introduced at the show was the Koehring 205 Skooper, a 2-cu. yd. loader which can serve as a shovel or be converted into a hoe, dragline, clamshell, or lift crane. The track-mounted loader's upper machinery can swing a full 360 degrees, and its "standing-still loading" principle is said to eliminate the high maintenance cost of front-end loaders.

Also introduced at the equipment show was the Kwik-Mix Hi-Lifter, a front-end loader which can be converted into a fork-lift with no additional changeover of parts. The Hi-Lifter base machine features a 1-cu. yd. capacity bucket which can carry 1¼ cu. yd. heaped. The machine is capable of reaching 5 ft., and the entire operating mechanism pivots ahead of the operator.

Koehring also introduced the new 100 Dumptor, designed for heavy-duty, off-road hauling. Equipped with a torque converter drive, the Dumptor has a capacity of 15 tons. The operator's seat is pivoted, and the unit is equipped with a dual set of controls so that the operator can face the direction of travel. The Koehring 100 Dumptor has a choice of dumping systems—instantaneous gravity dump or controlled gravity dump. Dumping control in the latter operation is provided by hydraulic cylinder snubbers.

The Koehring Model 60 Dumptor, also designed for rugged, off-road hauling, was put through its paces for the group. The unit has a 6-cu. yd. capacity and is powered by a diesel engine which develops 6 hp. for every gross ton of vehicle weight. Equipped with hydraulic power steering, this vehicle also has dual steering for no-turn shuttle operation.

A complete highway paving setup, which includes the world's largest paver—Koehring Division's Tri-batch machine—was displayed, along with a variety of excavating, spreading, drilling, and boring machines.

Participating in the Koehring 1960 show were the following company divisions: Buffalo-Springfield Co., Springfield, Ohio; Flaherty Manufacturing, Pocatello, Idaho; C. S. Johnson Co., Champaign, Ill.; Koehring Division and Koehring Export Division, Milwaukee; Koehring-Waterous, Ltd., Brantford, Ont.; Kwik-Mix Co. and KA-MO Tools, Port Washington, Wis.; Parsons Co. and Shawnee Mfg., Newton, Iowa.

U. S. Fluorspar Output Sags To Lowest Point in 21 Years

Output of fluorspar from domestic mines declined in 1959 to the lowest figure in 21 years, according to U. S. Bureau of Mines reports. Finished fluorspar production (shipments from mines and mills) dropped from 319,513 tons in 1958 to 185,091 tons in 1959; value dipped from $15,071 in 1958 to $8,680 in 1959.

Mine production went from 818,-100 tons last year to 405,700 tons; crude material milled or washed, from 814,800 tons to 442,000 tons; and cleaned or concentrated fluorspar recovered, from 310,600 tons to 195,100 tons.

last year over 100 firms lowered their multiwall bagging costs through UNION-CAMP'S

PACKAGING MACHINERY

another FREE service of the ★5 Star Packaging Efficiency Plan!

More efficient packaging machinery is just one feature of the 5-Star Plan. Yet it has helped over 100 companies lower their multiwall bagging and handling costs. All within the last two years!

A midwest packer—by following recommendations made by UNION-CAMP packaging engineers—speeded his bagging rates and saved $48,500. A southern multiwall user now enjoys similar economies. As a result of a 5-Star Plan survey, he installed a UNION I & C Bagger. The new unit cut his labor expense 60 per cent.

For many other firms, installing automatic I & C Acto-Cutters on bagger sewing heads has reduced bagging crews by as much as a third.

The 5-Star Plan offers you impressive money-saving opportunities regardless of the size of your operation. Besides packaging machinery this comprehensive service covers bag design, bag construction, specifications control and a detailed survey of your plant.

And it's free!

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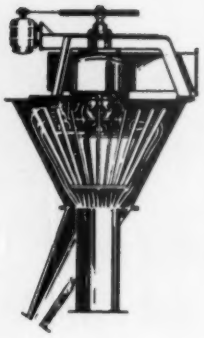
to

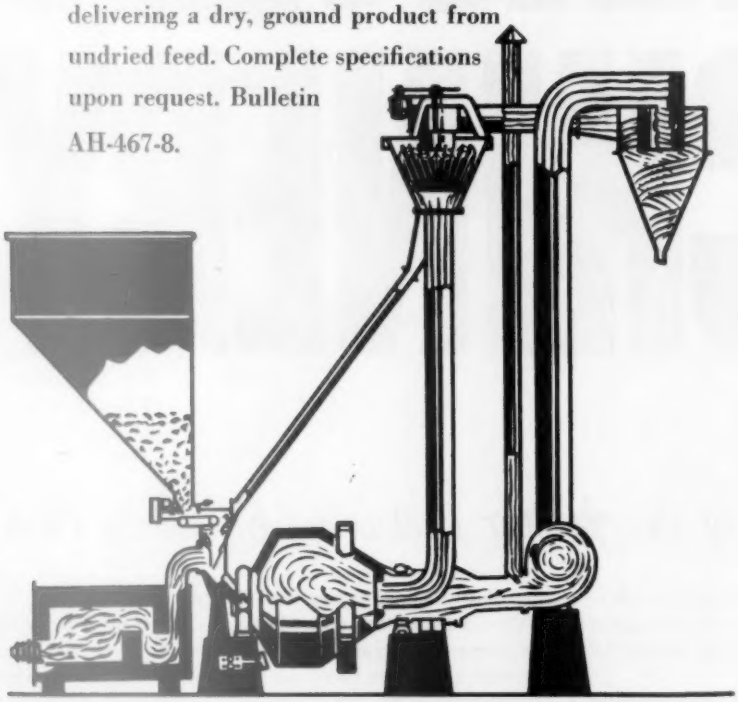
400 MESH



. . . in a few minutes, without interrupting operations. Yet any desired mesh may be maintained continuously. Ease of adjustment and close product control are possible with the . . .

"Gyrotor" Air Classifier

The Hardinge Gyrotor Classifier system, combined with a Hardinge grinding mill is an integrated grinding, classifying and product conveying system. Also available with an air-heating furnace for delivering a dry, ground product from undried feed. Complete specifications upon request. Bulletin AH-467-8.



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STATEMENT OF OWNERSHIP

Statement required by the Act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1960.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, PIT AND QUARRY PUBLICATIONS INC., Chicago, Ill.: Editor, W. E. Trauffer, same; Managing Editor, W. E. Trauffer, same; Business Manager, William A. Wilson, same.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

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James E. Montgomery, same.
Evelyn W. Montgomery, same.
Stanley A. Phillips, Elkhorn, Wis.
Florence S. Phillips, same.
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3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the Act of June 11, 1960, to be included in all statements regardless of frequency of issue.) 13,536.

W. A. WILSON
Signature of Business Manager.

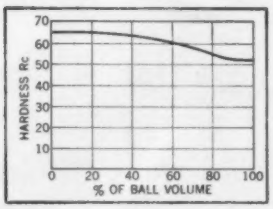
Sworn to and subscribed before me this 3rd day of October, 1960.

JAMES G. KOSTKA.
(SEAL)
(My commission expires April 28, 1963.)

Work is under way on the new lightweight aggregate plant being built by Great Western Aggregates near Boulder, Colo. Included are four storage silos (with a total capacity of 18,000 cu. yd. of aggregate) an office building, a service and maintenance building, and the main production plant.

Enter 51 on card, page 197 →

Immediate delivery on USS Grinding Balls We can ship immediately from stock as requested a range of sizes from ¾″ to 4″ in USS Carbon-Manganese and USS Alloy Steels. Here are three reasons why USS Grinding Balls should be specified: **Maximum hardness** combined with superior toughness. **Deeper hardness penetration** achieved by careful combination of chemical composition and heat treatment. **Uniform roundness** from ball to ball, load to load, for less wear and superior performance. If you have a delivery, performance, or selection problem, call our nearest Sales Office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.



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USS

"new H-90B PAYLOADER® loads out 200 yds. per hour"

two H-90B's serve at pit and stockpiles for *Roy L. Houck Sons Corp.*

The dependability and superior work-ability of Model H-90B "PAYLOADER" tractor-shovels have been thoroughly proven by two of the units at Roy L. Houck Sons Corp. aggregate plant near Eugene, Oregon.

AT THE CRUSHER — for general purpose work, excavating, maintaining haul roads and stockpiles. In emergencies, when their power shovel fails, the H-90B moves in to load raw rock and gravel into haul units . . . loading at a rate of 200 yds. per hour from stockpile.

AT THE PIT — the other H-90B loads haul trucks with finished materials for a new freeway being constructed between Albany and Eugene.

What makes the H-90B "PAYLOADER" outstanding?

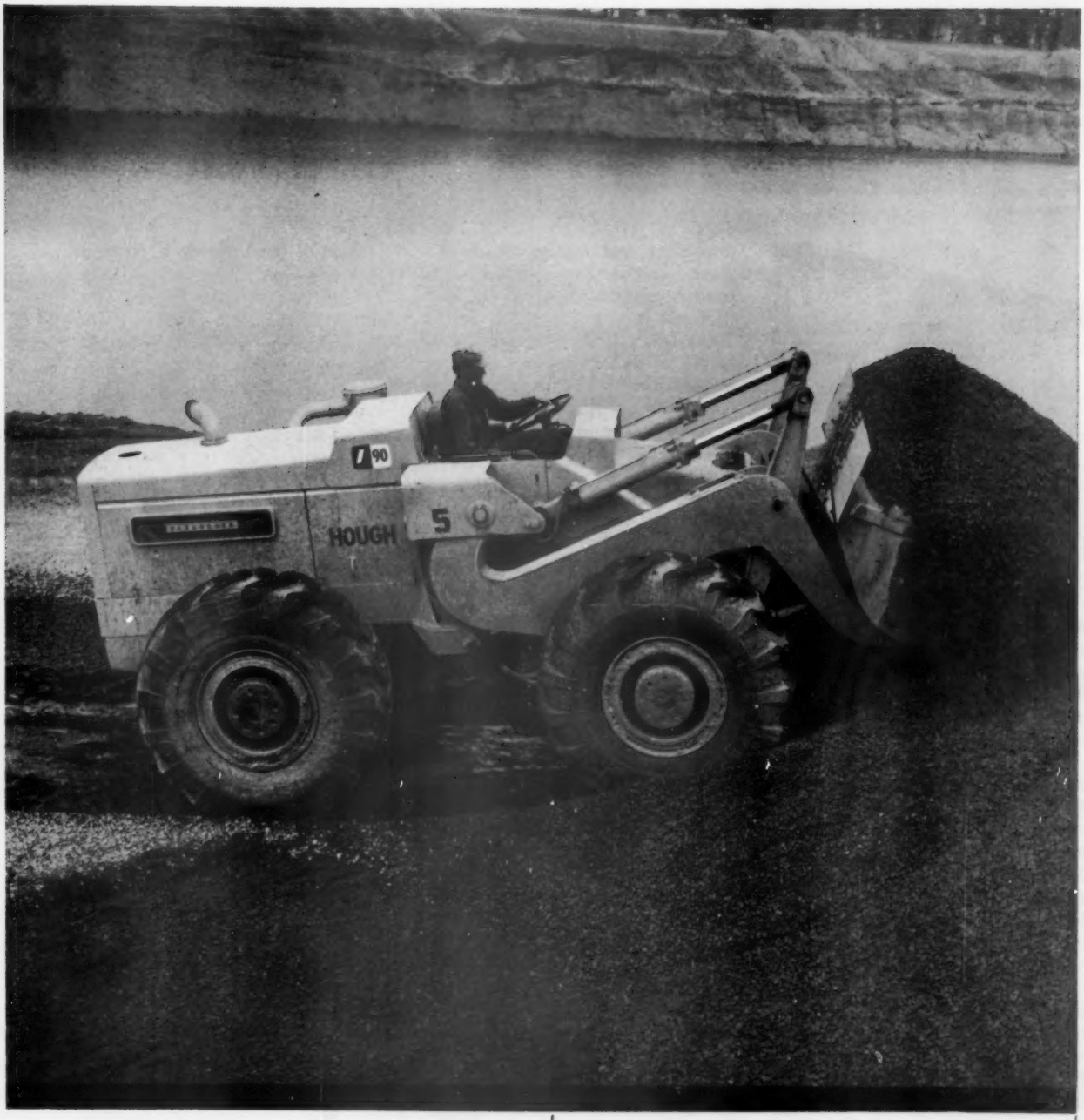
Hough has engineered many superior design, construction and performance features into this 9,000-lb. operating capacity "PAYLOADER", such as: POWER — a new turbo-charged diesel engine that develops ample horsepower (162) to handle traction and *all* hydraulic requirements at the same time . . . STABILITY — Longer wheelbase, wider tread *plus* added machine weight to provide a "balanced-stability" factor for *any* working condition . . . STRENGTH — Design improvements and use of alloy steels in critical structural parts gives the H-90B a greater "work range" potential than any unit of comparable size . . . OPERATION — Improved full power-shift-transmission with matched torque converter results in quicker throttle responses and faster operating characteristics . . . SAFETY — Power air brakes on all four wheels, dual cylinder power steering, dual brake pedals and single lever power-shift . . . all add up to fatigue-free operating effort for fast operating cycles.

A size for every need!

In order to fit your exact plant requirements, you have a choice of five 4-wheel drive "PAYLOADER" sizes, ranging in operating capacities from 3,000 to 12,000 lbs. Each model is outstanding in its class and all are available with regular buckets or the patented Drott "4-in-1" that functions as a shovel, clamshell, scraper or bulldozer. Ask your Hough Distributor to help you select the "PAYLOADER" that best fits your needs.

Power, traction, tip-back bucket action and bucket design combine to dig full bucket loads in a hurry.

Dumping clearance of 9'11"—more than any machine in its class—loads trucks easier, stockpiles higher.



Your "PAYLOADER" Distributor is ready to serve you with the most complete parts and service setup in the rubber tire tractor-shovel business, backed by factory service personnel. Contact him today or return the coupon for more data.

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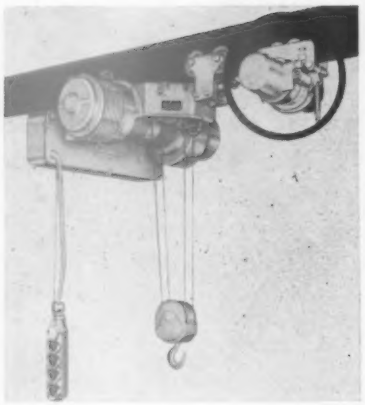


● The "P&H Pull-a-Hoist," designed to power any make of hoist along any standard I beam or wide flange beam, has recently been introduced by Harnischfeger Corporation.

Ease of installation is stated to be a chief feature of the monorail Pull-a-Hoist. Weighing 83 lb. and requiring 12 in. of headroom, it uses only 13 in. of rail space for "end approach." Operating features of the unit include adjustable torque brake and a motor built to minimize load jerking or swaying.

The unit is available with single or two speeds, with separate push-button controls, or with integrated hoist-and-tractor control. The standard model is single-speed 220-volt, three-phase, 60-cycle. Options range from 110-volt up to 550-volt, and 50-cycle where required. The manufacturer reports maximum loads of 13,000 lbs. can be towed at 60 ft. per minute, with lighter loads traveling proportionately faster. **(350)**

● The new Porta-Screen, a portable screening unit for size testing blacktop ores, concrete aggregates, and similar materials in those applications where screening is done by hand, is being offered by the Gilson Screen Company.

The unit is recommended for field inspection and testing, ready-mix plants, and similar installations. It handles samples up to 25 lb. in a practical size range of 1½ in. to 200-mesh. The Porta-Screen can be hand or motor driven; operated free-standing on any surface, or bolted to a semi-permanent location, or on bare ground (with retractable spiked feet). The unit can be dismantled into two portable sections.

The wire cloth edges of the sections are imbedded in vinyl plastic. The sections can be removed or interchanged. **(351)**

● The Reo Division of The White Motor Company now offers a new V-8 truck and tractor series with a 90-in. bumper-to-back-of-cab measurement. All models in the D-600 and D-700 series are powered by Reo's Gold Comet V-8 gasoline engines.

The series consists of six models: two single axle tractors with g.c.w. ratings of 65,000 and 78,000 lb.; two tandem axle tractors with g.c.w. ratings of 70,000 and 78,000 lb., and two tandem truck models with g.v.w. ratings of 42,000 and 52,000 lb. respectively.

Each of these models is powered by Reo's Gold Comet OV-207 hp. V-8 engine with the OV-235 hp. unit available as an option. The manufacturer reports that the 90-in. bumper-to-back-of-cab measurement permits the tractors in this series to haul 40-ft. square nose trailers within 50-ft. legal limits.

Designed specifically for over-the-highway operations, the standard tractor wheelbases are 134-in., with a c.a. dimension of 72-in. Standard wheelbases on the tandem truck models are 158 in. For all models, longer wheelbases in 6-in. increments are available.

Standard transmissions are the Fuller 5A65 in the single axle tractor and tandem trucks, while the Fuller R-46 is standard in the tandem tractor models, D-633 and D-733.

Optional transmissions include the Fuller 5AW65A and the Spicer 6352 as well as Reo-Matic drive. A wide variety of Spicer auxiliary transmissions also are offered.

Rear axles by Eaton and Rockwell range in capacities from 21,000 lb. to 38,000 lb. in single reduction, double reduction, helical, hypoid, and hypoid-helical types. **(352)**

and equipment

for further information use card on page 197

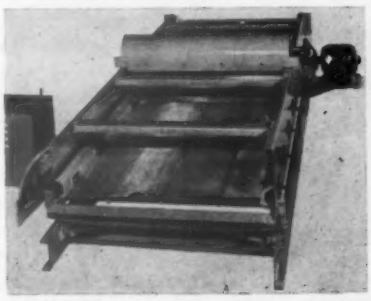
● Refinements in the successful suspension system introduced last year, moderate frontal styling changes, and improvements in chassis and cabs mark the 1961 Chevrolet truck line. The suspension, using independent front springing with torsion bars and rear coil or variable-rate leaf springs, is carried over with only minor changes.

Cabs are improved, with a smaller floor tunnel in some models for increased leg and foot room. Other improvements include refinements in power brakes, more durable valve seats, increased spark plug gap life, and improved heaters.

New optional equipment includes a temperature controlled hydraulic fan drive, a crankcase ventilating system, additional 2-speed axle, and cab comfort package. (353)

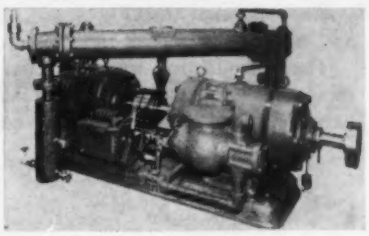
● Universal Vibrating Screen Company is offering the newly designed "Unilec" electrically heated vibrating screen. This Type "K", 4 ft. by 10 ft. screen is designed for use either as conventional unheated, high frequency screening equipment or as an electrically heated unit. It is offered with one or two decks, with either or both decks heated. It operates at 1750 r.p.m. using single groove V-drive. The single deck unit weighs approximately 1400 lb.

New laminated aluminum conductors with spring action eliminate cable conductors. Two 4 ft. by 5 ft. panels are used as a split deck for efficient series heating and rapid mesh changes. Latest type, extruded aluminum side rails provide for uniform mesh tension and even distribution of heat over the entire screen mesh area.



The manufacturer reports the following: use of heating permits greater production and finer screening by eliminating blinding of damp, difficult-to-screen materials, as in certain clay, limestone, and similar operations. The heater unit, changing the primary current voltage (220, 440, 550) to a range of 1 v. to 14 v., with constant increase in amperage to as high as 6000, raises the temperature of the cloth to about 130 deg. F., with no material going over the screen. (354)

● A new line of compact, preassembled two-stage rotary compressors has been announced by officials of Fuller Company. Designed to simplify installation and foundation problems, the units feature an overhead intercooler for compactness.



The new line includes two-stage models from C60-60H to C300-300H. These cover capacities from 279 to 3300 c.f.m. and discharge pressures to 125 p.s.i. Direct connection can be made to electric motors, gas motors, or gear-turbine drive. Each stage consists of a cylinder with heads, thoroughly water-jacketed. Intake and discharge openings are located in a horizontal plane on opposite sides of the cylinder, avoiding reversal of air flow and further simplifying piping. (355)

● The 1961 line of Dodge Trucks offers 140 basic models which include conventional-cab, cab-forward, 4-wheel-drive, forward control, and tandem units. Eleven gasoline engines will be offered, ranging in horsepower from 101 to 228. Eight diesel engines, ranging in horsepower from 160 to 250 will also be available. G.v.w. ratings on the new trucks range to 53,000 lb. and g.c.w. ratings to 76,800 lb.

A stylish Dart half-ton pick-up headlines a completely new series of light and medium tonnage 1961 Dodge trucks. The manufacturer reports these new models feature the only inclined 6-cylinder gasoline engines in the trucking industry, and have great fuel economy.

The introduction of four Cummins diesel engines headlines advances in the Dodge high-tonnage trucks. These are the C-160, NHE-180, NHE-195, and the NH-250.

Illustrated is the 1961 Dodge CT-800 dump truck, equipped with a rugged 361-cu. in. V-8 gasoline engine developing 204 hp. with its short 89¾-in. BBC dimension. Available in five wheelbases from 134 to 212 in., the CT-800 has a maximum g.v.w. rating of 45,000 lb. This unit has a 10-cu. yd. Heil body.

Also pictured is the largest unit in the 1961 Dodge truck line, the NCT-1000 tractor, featuring a Cummins NH-220 diesel engine with a displacement of 743 cu. in. Available in five wheelbases—from 146 to 200 in.—it has maximum g.c.w. rating of 76,800 lb., with swing-out fenders for fast engine accessibility. (356)

● The new "Minuteman" portable drill produced by Mobile Drilling, Incorporated is a compact, multi-purpose, rotary unit designed for subsurface exploration and production drilling in stone, concrete, and soils.

The manufacturer reports the following: the Minuteman uses continuous flight augers from 3 in. to 12 in. in diameter, and drives 6-in. diameter augers to 30-ft. depths; when equipped for core drilling, it drives "EW" core barrels to 200 ft. When equipped for masonry drilling, the Minuteman cuts 1-in. to 8-in. diameter cores from steel reinforced concrete in standard lengths required for quality control testing.

As a production boring rig it also permits fast, economical erection of fences, guard rails, and similar in-

stallations, and works with standard soil sampling tools.

The portable rig weighs only 150 lb., features a 6 hp. engine, 8 speed automotive transmission, diaphragm-type carburetor for drilling at any angle, 44-in. stroke with power or hand feed both in and out of the hole, wheel mounted base for easier handling and two point anchoring for maximum stabilization. Although designed for one man portability, the Minuteman may be adapted for truck or trailer mounting.

Minuteman core and masonry packages available; also line of soils, rock, and horizontal drill tools and accessories. Basic package has auger tools for drilling 3-in. dia. holes 25-ft. deep. (357)

ALLIS-CHALMERS

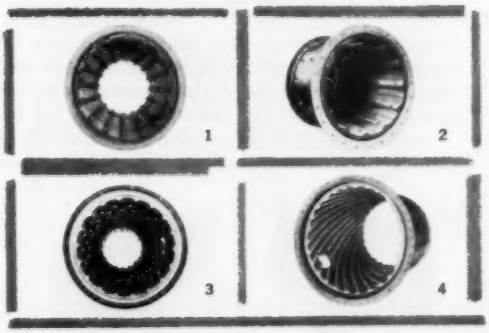
It takes at least four points-of-view

to create the shell liner that does the best grinding job for you

When A-C engineers recommend a shell liner for your grinding mill operation, you can be sure of one thing: it represents years of experience in all phases of mill operation. The first step in determining the right type is a four-point metallurgical and wear pattern analysis. Here are the four points:

First, the ore is analyzed for hardness and abrasiveness. Second, the fineness of grind is examined — a coarse grind requires lifting the grinding media high for impact; a finer grind calls for more abrading action. Then, the mill itself is studied to determine the size of balls or rods needed to accomplish the required grind. Finally, the metallurgical properties of the liner material are investigated to assure longer life.

The right liner lasts longer — and often increases the capacity of your mill. *Ask your A-C representative to look into your shell liner problems, or write* **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wisconsin.* A-1366



These four types of liners demonstrate how liners can vary over a wide range of design characteristics to meet the specific requirements of a job. Pictured: (1) Lorain liner, (2) wave type, (3) wedge type and (4) spiral liner.

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You get more power...reduce maintenance...increase reliability when you convert to Buell Silicon Rectifier Units

Buell Silicon Rectifier units can increase efficiency of your rectifiers 25% or more ■ Perfected and specifically designed for fast, simplified conversion of existing mechanical or tube rectifiers ■ They cut operating costs, reduce overall maintenance ■ Enable more efficient utilization of power ■ Eliminate rectifier maintenance ■ Reduce outages ■ Reclaim plant space ■ Suitable for indoor or outdoor installation ■ For only a small investment you can materially improve your rectifier performance ■ For details of the unit and a specific proposal write: Buell Engineering Co., Dept. 18-K, 123 William Street, New York 38 ■ Northern Blower Division, 6407 Barberton Ave., Cleveland, Ohio ■ CYCLONES, ELECTRIC PRECIPITATORS, BAG COLLECTORS, COMBINATION SYSTEMS, CLASSIFIERS, FANS.

ALLIS-CHALMERS

How screens help you win the battle of the specs

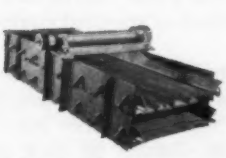
Meeting specifications can put the pinch on profits in a hurry in the aggregate business. To make profits, you need the most efficient screens . . . screens that give top performance, low maintenance and operating costs.

Scalping, sizing, washing, rinsing — all of these screening operations get individual attention from A-C engineers. Years of experience in handling specification problems like yours have resulted in a wide range of screen sizes and features, making it possible for A-C to provide the exact screen to fit your application.

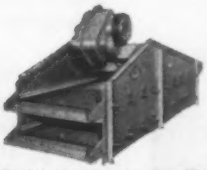
Whether you're replacing obsolete equipment or building an entirely new plant, the right screens can help you cut down costs and produce more aggregate that meets specification.

Let A-C engineers tackle your screening problems. Simply send them to us and Allis-Chalmers will submit an engineered recommendation on the most economical screen for your particular job. **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.*

Aero-Vibe, Low-Head, Ripl-Flo and ROM are Allis-Chalmers trademarks. A-1352

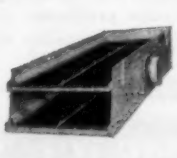


AVS Aero-Vibe inclined screen for economical sizing, up to 3½ inches, wet or dry.



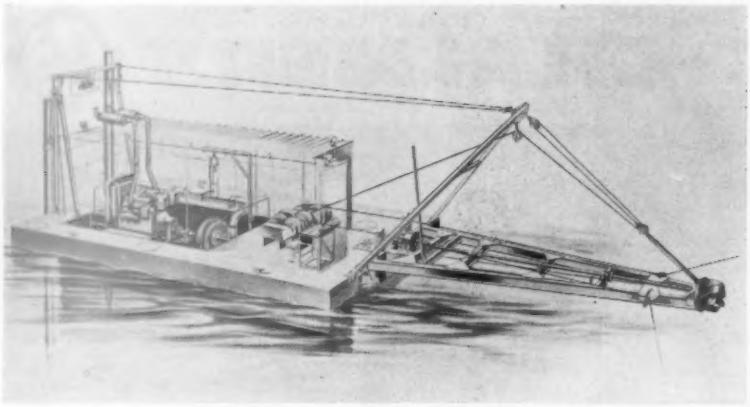
Low-Head horizontal screen for efficient coarse to fine sizing (wet or dry), rinsing, washing, dewatering, media recovery.

XH Ripl-Flo inclined screen for cost-saving scalping and coarse sizing, wet or dry.



SH Ripl-Flo inclined screen for light scalping, coarse or fine sizing (wet or dry), rinsing or washing.

XXH ROM inclined screen, a brute for tough primary scalping jobs and high tonnage.



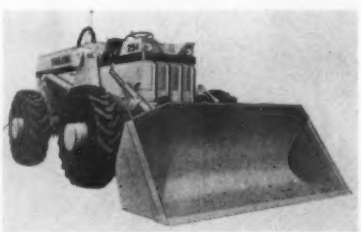
● A series of design refinements has been standardized into the line of "Dragon" model portable dredges of Ellicott Machine Corporation. Introduced to meet the need for mobility and versatility in dredging equipment, the units are completely electro-hydraulically operated with unified fingertip controls to facilitate handling ease and lessen operator fatigue. These portable dredges are available in varying sizes.

A major feature is the patented two-piece hull that disassembles quickly for transfer by truck or rail car from one job site to another and permits reassembly either ashore or in the water. The hull itself is rectangular in shape to provide maximum flotation, safety, and resistance to cutter torque.

The manufacturer reports that work-stopping damage from cave-ins of rock and debris is eliminated because no important machinery, including hydraulic cutter motor, is under water; and that all hull connectors are located above the waterline, assuring against hull leaks.

The dredge house is described by Ellicott Machine as having ample space for maintenance, operation, ventilation, and safety, and is constructed with a maximum amount of space between the inside of the hull and the actual dredging unit. **(358)**

● The newest addition to the line of tractor-shovels produced by the Trojan Division, The Yale & Towne Manufacturing Company, is the Model 254. With 15,000-lb. lifting capacity and bucket sizes from 2

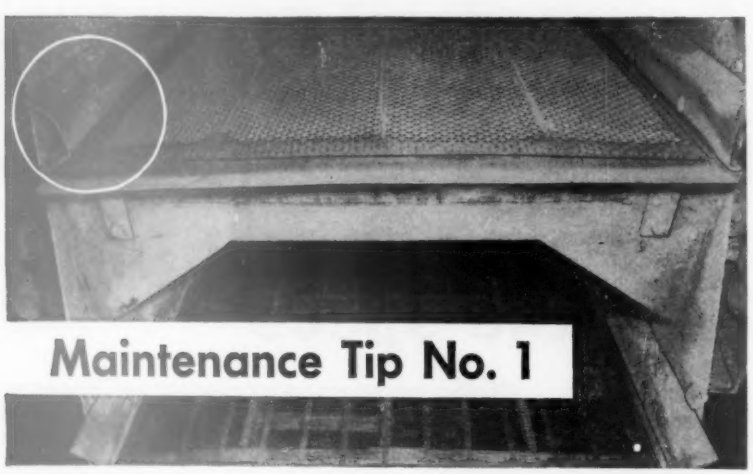


to 3-cu. yd., the new Trojan Model 254 is designed primarily to fill the gap between the Trojan Models 204 in the 12,000 lb. Class, and 304 in the 18,000 lb. class.

Among the features of the Model 254 are full power shift transmission, planetary axles, power steering, and four-wheel air-powered hydraulic brakes. A complete line of attachments gives the Model 254 job flexibility. Road speed of 24 m.p.h. permits fast, easy moves from one job to another.

Trojan's safety-curve lift arms give protection to the operator while the wide tread and long wheelbase provide stability under difficult working conditions. A torque proportioning differential axle permits full utilization of power. Both gasoline and diesel operation is available through three engine options. A fully adjustable bucket seat, lights, and a complete panel instrumentation are provided as standard equipment.

Total weight is approximately 24,500 lb. with an over-all length of 20 ft. and width (over axle hubs) of 8 ft. 10 in. Bucket tip back at ground level carry position is 40 deg. **(359)**



GRIPPER EDGES ON VIBRATING SCREEN SECTIONS

Is the gripper or flange design right for your vibrating equipment? Are the flanges held parallel? Is the radius of the flange hook correct? Does the cloth lie flat? Are the ledges clean? Is the tension drawn on the screen section squarely? Check these points carefully to correct gripper edge problems. Call Cleveland Wire Cloth for valuable assistance and top quality vibrating screen section cloth.

Write for *FREE* maintenance-reducing check sheet today.

THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 EAST 78th STREET CLEVELAND 5, OHIO

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● Motor control centers with bus capacity from 200 to 2000 amps, for voltages from 110 to 600 are now available from Allis-Chalmers. The centers, offering improved operation, easier maintenance, and increased versatility over individual units, are used to control electrical loads such as motors, lighting, welding, and heating in industrial plants and commercial buildings.

Available either as fusible or circuit-breaker combination units, the control centers consist of two or more starters fed from a common bus and are often attached to transformers or switchgear to form a unit substation. Substations can be purchased as a complete package or as individual units. All control compartments of like size are interchangeable anywhere in the control panel.

Outstanding control center features of primary interest to users include reduced engineering and installation costs; savings in floor space up to 33 percent; and versatility of unit through plug-in design, which means that units can be easily moved from one location to another. Only onemain circuit breaker is needed for one center; and equipment is centralized. Maintenance is therefore simplified. Increased safety is afforded through mechanical interlocks on the doors, these shut off the current when cubicle doors are open. Also, the new units have two doors for dual-mounted breakers, permitting one breaker to be serviced without interruption to the other. (360)

● Two new sizes have been added to the line of heavy duty vertical centrifugal sump and process pumps manufactured by Goulds Pumps, Incorporated.

The new 6-in. and 8-in. discharge units are available for pit depths from 3 to 20 ft., for either dry-pit or wet-pit service, and of iron, bronze-fitted, or stainless-steel construction.

Goulds pumps capacity range is from 1,000 g.p.m. to approximately 3,000 g.p.m.

The open impeller used on all units has ejector vanes on the back side which prevent entrance of, and jamming by, solids. The 6-in. pump will handle solids up to $1\frac{11}{32}$ in. in diameter, and the 8-in. will handle solids up to $2\frac{27}{32}$ in. (361)

ANOTHER FLEXCO SPLICE DOING A DEPENDABLE JOB AT *MATERIAL SERVICE CORP.*

Picture courtesy of Material Service Corp., Yard #15, Lockport, Ill.

Cutaway of a Flexco application showing compression plates, teeth and precision-made bolts and nuts.

Belt maintenance crews like to work with Flexco fasteners because they are easy to apply — joints last a long time — worn plates can be replaced quickly — ideal for repairing rips and tears.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . The quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, COAL & METALS, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

NEW "25-PAK"

"25-PAK" contains enough fasteners to join common belt widths.

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"FOR THE SPLICE OF A LIFETIME"

Flexible STEEL LACING COMPANY

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FOR RESULTS LIKE THIS ON YOUR NEXT SHOT...

WHICH

There's a lot of easy digging in this low-lying, well shot pile. A minimum of secondary blasting is needed, and there's no towering muck pile to come showering down on your men or equipment. Breakage and displacement like this gets every possible hour of service out of all your equipment.

Effective blasting control doesn't just happen. There is a combination of explosives and blasting methods that is right for every shot. For instance, if the conditions in your quarry lend themselves to the use of AN blasting agents, *new* Atlas Pellets are porous, compact particles that have higher density and sensitivity for more efficient blasting. On the other hand, for some rock formations, high explosives often do a better job—and more economically. In addition, all types of blasting caps, primers, and special packaging methods are available from Atlas . . . each designed for certain conditions and types of work.

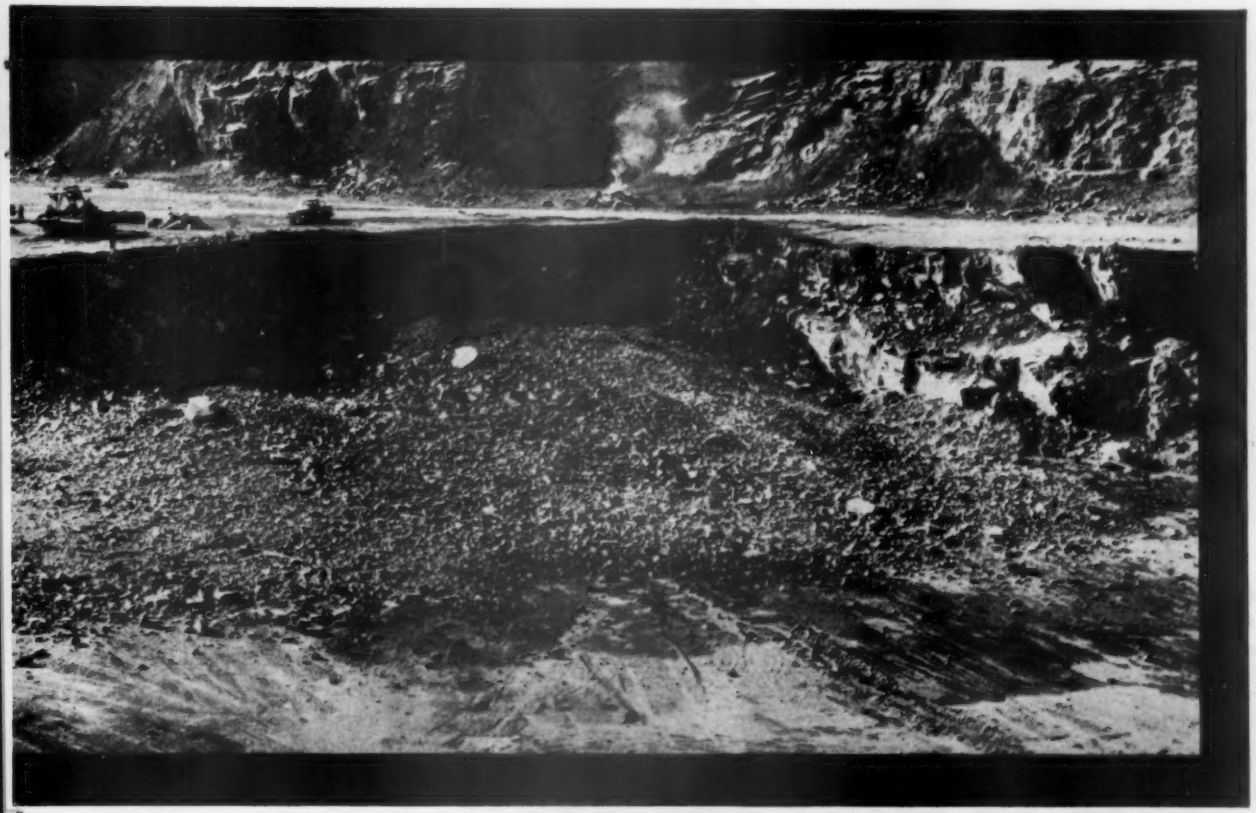
Which Explosive? That's the job of your Atlas Representative. Backed by the complete Atlas line (including all types of ammonium nitrate), his experience with the latest advances in explosives and techniques can help you find the explosives combination and the particular blasting methods that will be most profitable for you on every shot. Our blasting cost chart, slide rules and technical literature are designed to help you determine your lowest true blasting costs. Ask your Atlas Representative about them—or write directly to:

ATLAS POWDER COMPANY
Explosives Division, Wilmington 99, Del.

When you use the right combination,
all your equipment
moves in sooner...
works faster...
produces more.

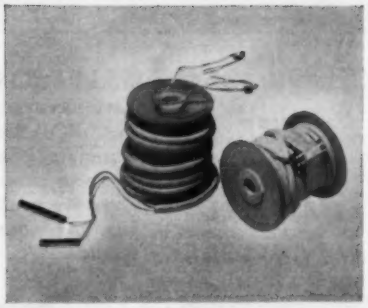
ATLAS PELLETS, a new form of ammonium nitrate, are porous, compact particles that have both the density and sensitivity required for efficient ammonium nitrate blasting.

EXPLOSIVE?



GIANITE, a pre-mixed form of ammonium nitrate, provides the flexibility needed to use ammonium nitrate blasting agents where on-site mixing is difficult or impractical.

GIANT "75" PRIMERS have the wallop required for complete, efficient detonation of both field mixed and plant mixed AN blasting agents, even under severe conditions.



TWINPLEX BLASTING CAPS are two E. B. caps with the leg wires enclosed in a plastic sheath—for detonation at the bottom of deep blast holes, the point of maximum confinement.

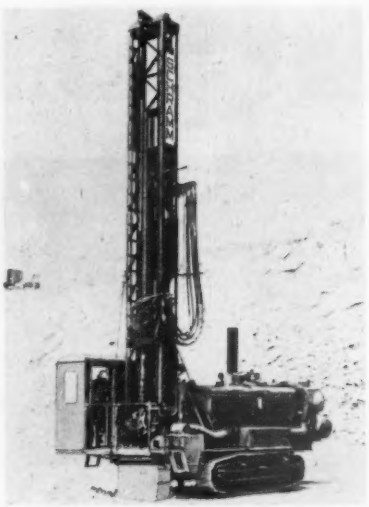
ATLAS EXPLOSIVES

A completely self-contained blast hole drilling rig has been introduced by Schramm, Incorporated. The manufacturer reports the Model C66 Crawler Rotadrill mounts all equipment necessary for drilling holes to the depths required in quarry and rock removal operations on a single self-propelled crawler.

The rig is designed for one man operation with all controls for drilling and maneuvering conveniently located in the operator's cab on the work platform. A separate air compressor is not required as a 600 cfm unit is built into the rig. The "Lazy Susan" rack mounted in the mast holds extra drill pipe ready to be swung under the drive sub and threaded as needed. Optional equipment includes a set of lights which mount on the mast for night operation.

The Model C66 is completely powered by hydraulics. The top drive rotation head is powered by variable speed hydraulic motors which can be adjusted to specific drilling conditions. Its design also permits the C66 to be used for drag bit, or tri-cone drilling in addition to ax bottom hole drilling with the Schramm Rotatool.

Individually controlled hydraulic gear boxes drive each crawler track through roller chains. Hydraulic rams in the mast can exert variable down pressures to 28,000 lb. A "watch dog" control enables the operator to govern the down pressure to meet varying drilling conditions while a micro-feed control regulates the rate of penetration. Hydraulics also operate the raising and lowering of the mast and outriggers.



Because all equipment on the rig other than the Schramm compressor is hydraulically powered, the entire output of 600 c.f.m. of free air at 100 p.s.i. is utilized in the hole. The manufacturer reports that by releasing this air at the bit, a high out-of-the hole velocity is created which produces improved chip clearing and dewatering; Schramm further reports that this enables cleaner holes to be maintained, increases penetration rate, lengthens bit life, and reduces the chance of a bit or drill pipe becoming stuck.

The Model C66 Rotadrill offers a choice of two masts, one with 25-ft. travel and the other with 35-ft. travel. Using the Schramm Rotatool, holes up to 6½ in. in diameter can be drilled by the bottom hole drilling method. With rotary drilling, larger holes can be obtained with the use of larger diameter drill pipe which is available as an option. **(362)**

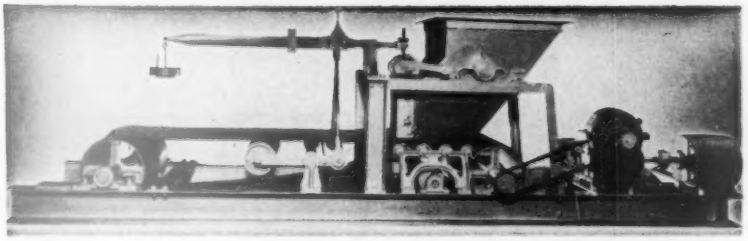
"Nilite" 101 is one of Du Pont's new line of nitro-carbo-nitrate low priced blasting agents. It was designed to fill the need for a free-running, non cap-sensitive product of medium density, for loading into holes of 2-in. diameter and larger.

The manufacturer reports the following: Nilite 101 gives good breakage in medium hard rock, and as a top load even in hard rock; the new blasting agent is considerably more sensitive to propagation than prill/oil mixtures; because of its improved sensitiveness, the reduction in the degree of confinement caused by the use of properly designed short interval delay blasting systems should not affect results adversely; fuse and cap delay systems are not recommended.

Density of the product is 0.70-0.75 g./cc. Velocity is 9,800 f.p.s. measured in 5 in. diameter in air. Higher velocity can be expected in larger diameter or under confinement. Packaging is in 50-lb. multiwall paper bags.

Among other features of Nilite 101 pointed out by Du Pont are: product is ready for loading as received, easy and dependable priming with primers recommended by Du Pont, non-dusty, and contains no head-ache causing ingredients. **(363)**

SCHAFFER POIDOMETERS



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Install a SCHAFFER POIDOMETER and you'll have accurate WEIGHT-DATA at your finger tips. POIDOMETERS are dependable and will eliminate production line snags—you will have compete assurance against costly errors. Poidometers are available with remote devices for showing and changing feed rate, and total weight records.

SCHAFFER POIDOMETER CO.

2828 SMALLMAN ST.

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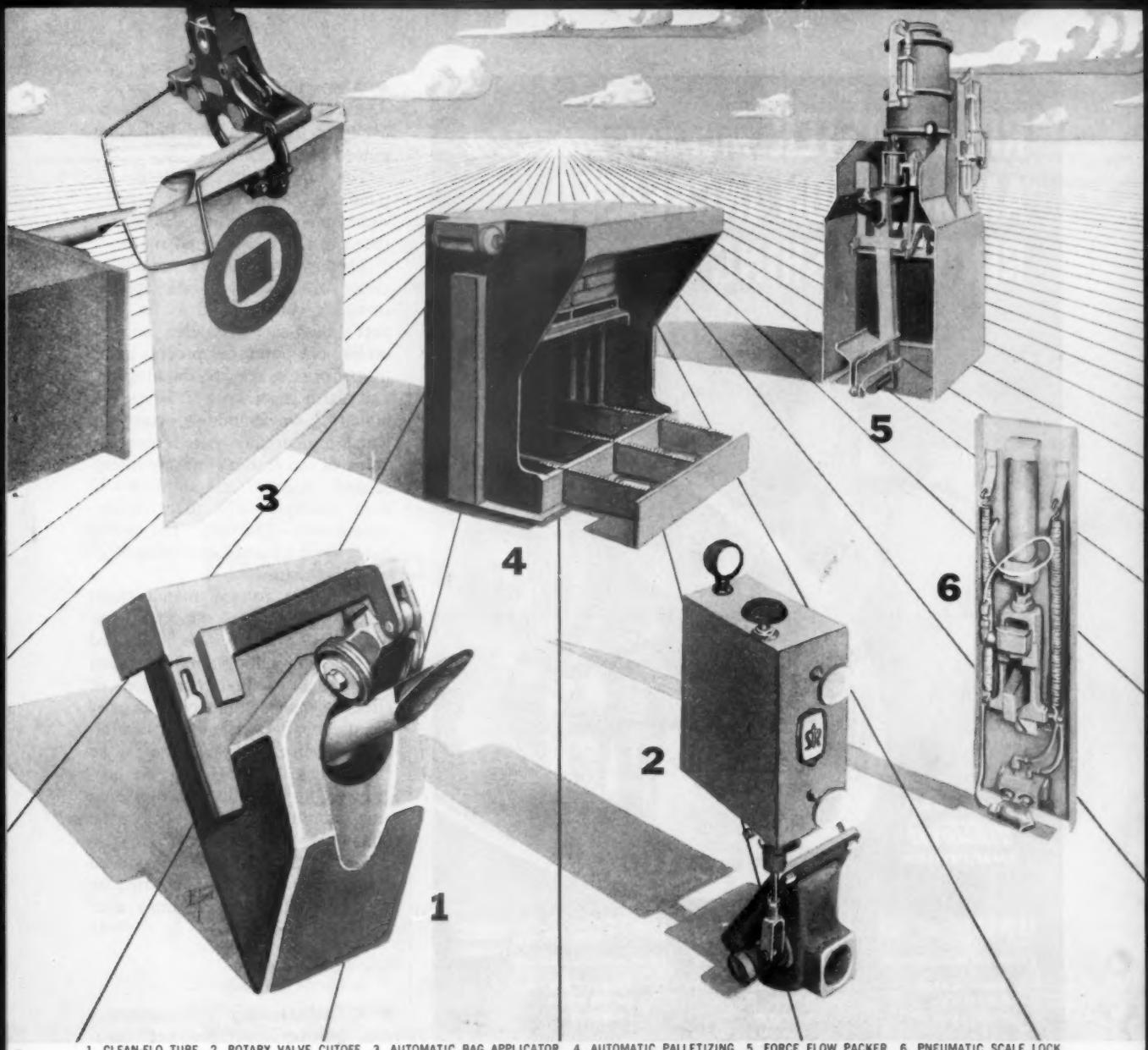


1. CLEAN-FLO TUBE 2. ROTARY VALVE CUTOFF 3. AUTOMATIC BAG APPLICATOR 4. AUTOMATIC PALLETIZING 5. FORCE FLOW PACKER 6. PNEUMATIC SCALE LOCK

St. Regis® takes 6 giant steps to improve cement packaging

Two years ago, St. Regis surveyed the cement industry to find what major improvements were being sought in cement packaging. Here are the results of our progress to date to give industry officials an answer to their six most important packaging problems.

1. CLEANER BAGS – The Clean-Flo® Filling Tube for the 150-FC Packer (proven in actual field use). 2. IMPROVED WEIGHT ACCURACY – New Rotary Valve Cutoff for 107-FC Packer for better weight accuracy, cleaner bags and automatic discharge. 3. AUTOMATIC BAG APPLICATOR – Installed at St. Regis Bag Testing Laboratory, first performance tests have been successful. Field installation due late 1960. 4. AUTOMATIC PALLETIZING – Industry's first automatic palletizing system now operational. 5. PACKAGING EQUIPMENT – The St. Regis Force Flow® Packer, now under field testing, packs all cement products equally well with better weight accuracy and cleaner bags. 6. REDUCED MAINTENANCE – Pneumatic Scale Lock provides a simpler scale locking system, reducing dust and spill.

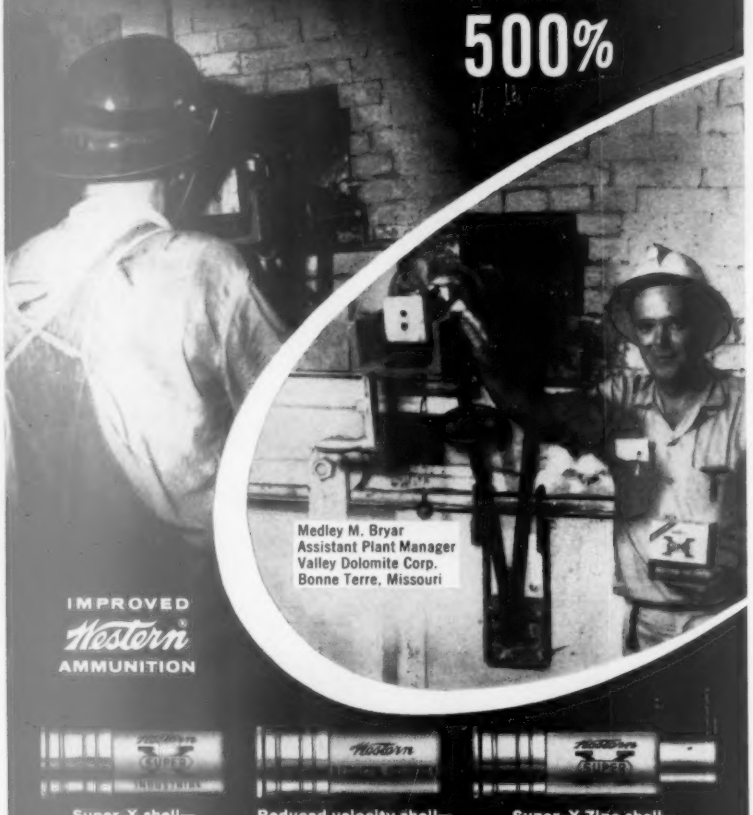
These and other outstanding developments are only part of St. Regis' search for answers to packaging problems–present and future–of the Cement Industry.

This is St. Regis *Packaging-in-Depth* in action – a complete bag service available from 13 manufacturing plants and 33 sales offices across the country.

Packaging-in-Depth by BAG DIVISION **St. Regis** PAPER COMPANY

AT VALLEY DOLOMITE...

RINGBLASTER with new Western® AMMUNITION INCREASED RING-SMASHING EFFICIENCY 500%



Super-X shell— 8900 ft./lbs. muzzle energy

Reduced velocity shell— 7500 ft./lbs. muzzle energy

Super-X Zinc shell— for maximum penetration

"New improved Western ammunition lets us fire 35,000—45,000 rounds without a stop for gun maintenance," says Medley Bryar. "This is a 500% improvement! The new shells reduce lead accumulation to a negligible point, deliver real smashing power, and are a major factor in our cost-reduction program. We're constantly on the lookout for ways to improve products and operations at Valley Dolomite—Ringblaster kiln gun and improved Western ammunition have filled the bill on fast kiln-ring smashing with a minimum of down-time!"

If you're operating a kiln, you can improve its efficiency with the industry-accepted team... Western Industrial Ammunition and Ringblaster, the safer, quieter kiln gun that's easiest to use. Write for complete money-saving details today!

RINGBLASTER® KILN GUN... *another product by*

Ramset® Fastening System

OLIN MATHIESON — WINCHESTER-WESTERN DIVISION
300-K Winchester Ave. • New Haven 4, Conn.

Enter 66 on card, page 197

● A new ultra fast, general-purpose digital computer, the PB 250, is now available from Packard Bell Computer Corporation.

The unit combines a large, expandable memory and a versatile command structure with computing speed in the microsecond range.

The low-priced unit is suitable for either on-line or off-line applications. It can be used as an engineer's desk-side computer, and for on-line computing for process monitoring, process control, data logging, and alarm generation. It is a serial, binnary, single-address computer with an internally stored program. Some of the features include microsecond speed, add/subtract—12 usec, multiply—276 usec, divide/square root—252 usec. The quoted times are for a word consisting of 21 bits plus sign.

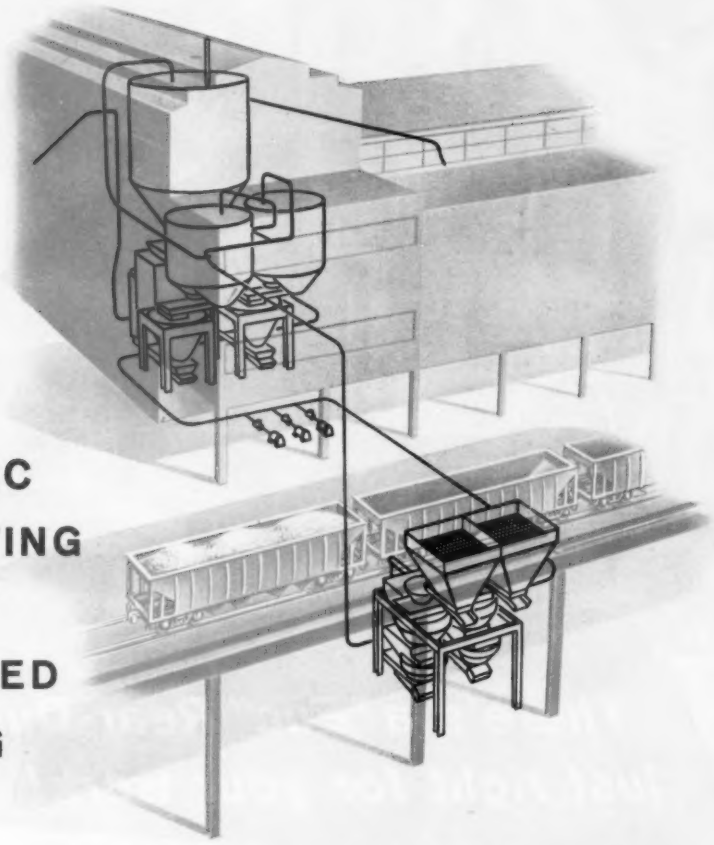
According to the manufacturer the unit eliminates one-shot engineering. As the system is defined by an internally stored program rather than by inter-connections of circuit elements, functional changes are easily effected and, further, alternate methods of operation can be tried. The PB 250 can be programmed to check its own operation and to monitor the operations of the remainder of the system.

As the PB 250 is to be produced in quantity, it will be supported by extensive reliability programs over long periods of time. (364)

● A self-standing, drill-mounting, and air-operated "Bencher" produced by Atlas Copco has been designed to fill the gap between hand-held rock drills and larger wagon drills.

The BMP 31 handles 5-ft. steel changes and mounts heavy-duty, high-capacity rock drills. A drill is mounted on the 80-lb. Bencher by means of two tie-rods connected with the end of a double-acting piston rod which moves in the Bencher's air cylinder. Constant feed pressure is achieved through use of a regulating valve at the top of the cylinder.

Piston diameter is 2⅝ in. The unit, when fully extended, measures 156½ in. long. Length, when contracted, is 87⅝ in. Air is delivered through a ½-in. hose. (365)



PNEUMATIC TRANSPORTING FOR CONTROLLED FEEDING BY

ALLEN-SHERMAN-HOFF

The diagram shows an A-S-H pneumatic system designed to convey bulk materials.

With this system, several materials are transported from track hoppers to separate storage bins in the plant. From a control panel at the track hoppers, one operator directs this flow of material to the appropriate bin. From the bins, the material is fed first into weigh bins and then, in controlled rates and quantities, directly into the proper receptacle. From another panel in the plant, a second operator controls this operation.

For such processes, pneumatic conveying systems are ideal. Compared with a mechanical system, the A-S-H pneumatic system is a tremendous space saver. In addition, it is flexible, versatile, and far more trouble-free.

The system shown is a pressure type conveying system. Our experience also covers vacuum type systems and combination vacuum-pressure type conveying systems. Bulletin PM-1 describes them all. Send for a copy.

The ALLEN-SHERMAN-HOFF COMPANY, 245 Lancaster Avenue, Wynnewood, Pa.

New Bulletin PM-1 can help pinpoint a system for your plant, your materials. Send for a copy.

There's a "Euc" Rear-Dump just right for your work!

Whatever your mine and quarry hauling job may be — stripping overburden, waste disposal, moving ore, rock and other materials — there's a type and size of job proved Euclid that can cut costs and step up production. With unmatched field experience and the parts and service facilities of a world wide dealer organization, "Eucs" meet every requirement for big performance on the toughest jobs.

For facts and figures proof that Euclid work-ability can mean lower costs and bring a better return on investment, call the Euclid dealer in your area.

EUCLID Division of General Motors, Cleveland 17, Ohio
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

R-10 10 TONS
R-15 15 TONS
R-18 18 TONS
R-22 22 TONS
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R-40 40 TONS
R-55 55 TONS

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12, 22 and 35-TON Semi-Trailer Rear-Dumps

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

a solution for your

Gift Problem

THOUGH it doesn't seem possible, the Christmas holidays are just around the corner, bringing the annual customer gift-giving problem and the taint of commercialism which has taken the joy out of giving. It seems that no matter how carefully a gift list is compiled, someone's name is left off; and the specter of a lost customer arises.

Several members of our industry have solved their annual gift problem with charitable donations in the names of their customers. This idea has been enthusiastically received by charitable organizations, and gift-giving becomes a simple matter for the donor. Here are a few examples of how the industry is making the spirit of Christmas meaningful again.

In Denver, employees of Ideal Cement Company dug into their pockets for cash and into their closets for old clothing, so that seven parentless children ranging from 5 to 14 years old could have a considerably merrier Christmas. Each of the children received three new pieces of clothing, used items, and a toy. Employees spent their lunch time packing the clothing and filling stockings with the traditional yuletide treats.

Last Christmas, Ralph H. Anderson, president, Anderson Concrete Products, Columbus, Ohio, reassessed his firm's traditional gift-giving problem and decided to do something of lasting benefit.

"We knew that tax money provided nourishing food, clothing, bedding and furnishings for the 275 children in Franklin Village, the county children's home, but none of these allotted funds can be used for play equipment," said J. Kitchel Smith, public relations director of Anderson Concrete. "Consequently, with our gift fund we purchased sand boxes, toys, and playground equipment for the children at the Village.

"Customers and friends of the firm were apprised of the gift program by a letter from officials of Franklin Village, thanking them for their part in making Christmas, and all of the coming year, a better time for the kids.

"We believe this sort of thing is the coming thing in larger industries," Mr. Smith said. "I have no doubt that we will be doing it again this year, and perhaps with another group as the recipient."

Employees of Harry T. Campbell Sons Corporation, Towson, Md., decided in 1958 to make Christmas brighter for a number of unfortunate children and formed The Empty Stocking Club, Christmas Party, Inc., Santa Claus Anonymous, Inc., and Kounty Kris Kringle.

Campbell employees took the amount of money they would have spent on Christmas cards and postage for fellow employees, and contributed it to any one of the organizations listed above. The first year $675 was collected, and in 1959 this sum was surpassed. The fund was distributed by a three-member contribution committee.

The Galesburg (Ill..) Builders Supply Company, instead of sending gifts at Christmas, established the Henry Gunther Memorial Scholarship in recognition of the continued patronage and support received from its friends and customers. This scholarship is awarded annually to deserving students in financial need who are studying in the fields of civil engineering, physics, mathematics, or chemistry. An annual scholarship of $750 was provided for Knox College and a $500 grant for the University of Illinois.

• To offset the prevalent commercialization of Christmas and avoid the possibility of offending customers unintentionally omitted from their gift lists, these producers took measures to make the spirit of Christmas more meaningful.

← Enter 68 on card, page 197

HOW TO SAVE $50-75 DAILY, SPEED CUSTOMER SERVICE

B. W. Beeman, Anderson, Ind., lowered handling costs and increased production of clay-gravel base mix by replacing a hopper-fed portable conveyor with a 48′ Barber-Greene PS-70 Portable Screening Plant with trap feeder.

The gravel company owner reports: "Our new plant helps us save $50-75 on the 500-1,000 tons produced daily. Now we doze material directly from bank to trap and save 10-15¢ per ton handling costs. We've speeded customer service, too, by being able to load out 10-ton trucks in 60 seconds. And the consistent accuracy of clay-gravel mix obtained by our dozer blending through the trap feeder gives us a competitive advantage that has brought in considerable new business."

Here's why your Barber-Greene Distributor can match this new plant to your needs: capacities—155, 270, 430 and 630 tph . . . belt widths—18, 24, 30 and 36″ . . . conveyor lengths—42 and 48′ . . . single deck screen sizes—36, 42 and 48″. Get this rugged plant with exclusive Vibra-Spring screen suspension and save money and time producing sized aggregates.

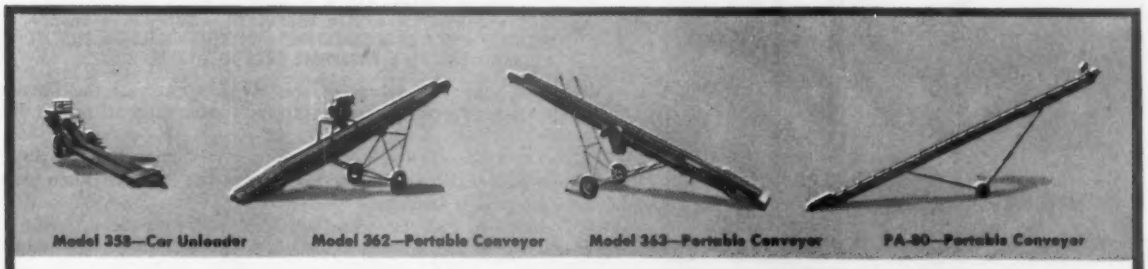
Heavy-duty portables cut stockpiling costs

J. P. Hollerich & Co., LaSalle, Ill., paving contractors, save time and money unloading and stockpiling aggregates for asphalt operations by teaming two portable Barber-Greene units, a 358 Hopper Car Unloader and a 24″ x 66′ PA-70 Conveyor.

Plant Supt. F. J. Funfsinn and Gen. Supt. John F. Livec relate: "Our Barber-Greenes give us the dependable high-capacity performance we need to keep our plant operating at top capacity. The unloader-portable conveyor team has unloaded 65,000 tons of ¾″ stone and sand at 120 tph, and we empty and stockpile 56 tons of rock from a car in just 30 minutes."

Highly-portable Barber-Greene 358 Car Unloader and truss-type PA-70 Portable Conveyor are shown unloading sand for Hollerich's Barber-Greene 894 Batch-Omatic plant located at Atkinson, Ill.

The Beeman-owned PS-70 plant has a 36" belt and a double loop Vibra-Spring screen suspension that puts 35% wet clay over the screen without blinding. This exclusive feature also doubles the shock resistance and life of vibrating mechanism parts.



Model 358—Car Unloader | Model 362—Portable Conveyor | Model 363—Portable Conveyor | PA-80—Portable Conveyor

Barber-Greene portables for every requirement

Barber-Greene's portable materials handling equipment line includes seven truss and channel frame Portable Conveyors plus the 358 Car Unloader. Biggest of the truss models is the PA-80, available in 69, 75 and 81′ lengths, available with torque-arm or line shaft drive. Other heavy-duty truss models, all in lengths from 33-60′, include PA-70 (torque arm drive), PB-70 (V-belt drive) and PC-70 (line shaft drive). Model 363 tops the channel frame line and is offered in 25, 30, 35, and 40′ lengths. Model 362 is available in 20, 25 and 30′ lengths. All are precision built and completely portable.

SEND FOR NEW BULLETIN

New Portable Conveyor Bulletin tells how these rugged units can cut your handling costs, shows how to select the correct models for every requirement, and includes full information about each conveyor in the complete Barber-Greene line. Ask for your copy today.

The ultimate in precision-built portable conveyors

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

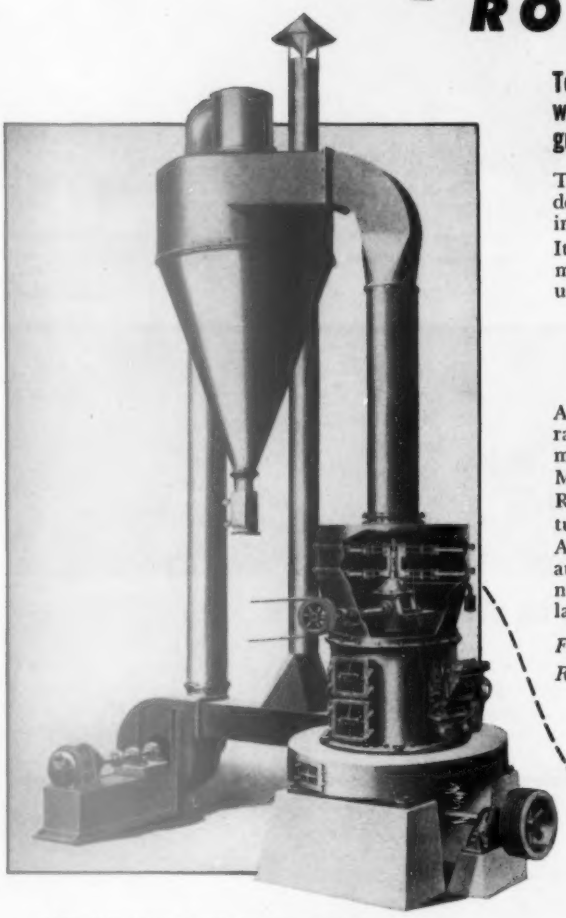
CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Enter 70 on card, page 197

roll up new production... and profit...records

with

Raymond ROLLER MILLS



RAYMOND MULTI-PURPOSE ROLLER MILL WITH DOUBLE WHIZZER AIR SEPARATOR

Top performing RAYMOND Multi-Purpose ROLLER MILLS with WHIZZER AIR SEPARATION lead the field in fine grinding in the CHEMICAL and PROCESS INDUSTRIES.

This Mill combines the Raymond High Side Roller Mill and the double Whizzer Separator to afford great versatility and economy in the handling of many fine grinding problems.

Its wide scope of application covers the preparation of powdered materials . . . from simple fillers to fancy chemicals. Typical products pulverized include . . .

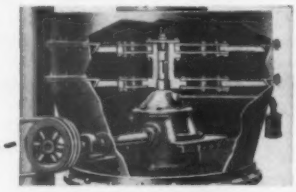
PIGMENTS • FULLERS EARTH • INSECTICIDES • IRON OXIDES • TALC • BARYTES • KAOLIN AND CLAYS • SULPHUR • CARBON MIXTURES • STARCH • LIMESTONE • BAUXITE • CALCIUM SILICATE • MINERAL FILLERS • PHOSPHATE ROCK • GYPSUM.

A single, easy adjustment of the Whizzer controls the fineness range from 20-mesh grades to products essentially all minus 325-mesh.

Mill capacities reach 40 tons per hour and more with a Super Roller Mill. Flash Drying Accessories may be installed when moisture removal is required.

All aspects of Fine Grinding are combined in a clean, dust-free, automatic system that is economical in operation and maintenance. Installations are flexible and readily adaptable to any plant layout.

For detailed information send for the Raymond Roller Mill Catalog Number 79Q.



Mills are available with Single or Double Whizzer Separators. Whizzers have set of radial blades attached to a disk that revolves on a vertical shaft in separating chamber. Variable speed drive insures finger-tip control of fineness.

COMBUSTION ENGINEERING, INC.

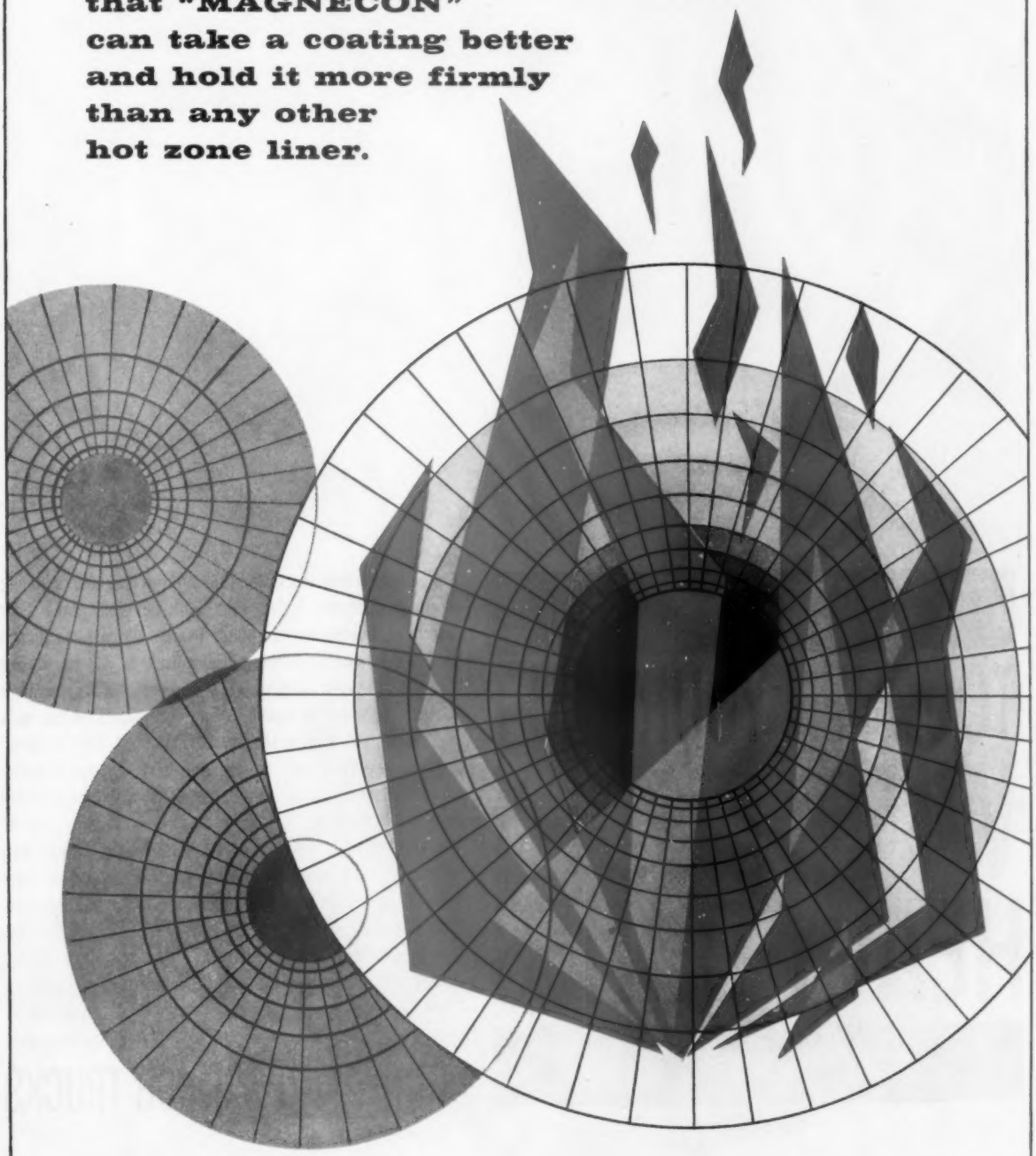
427 W. Randolph St.
Chicago 6, Illinois

Raymond Division

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

It has been demonstrated repeatedly that "MAGNECON" can take a coating better and hold it more firmly than any other hot zone liner.



CANADIAN REFRACTORIES LIMITED

CANADA CEMENT BUILDING, MONTREAL, CANADA

2462

A PRODUCT OF CHRYSLER CORPORATION

TOUGHEN YOUR FLEET WITH DODGE HEAVY-DUTIES

Dodge heavy-duty trucks for 1961 are the toughest, stingiest, workingest trucks we've ever built. Engines have been improved, beefed up all 'round. There's V8 gasoline muscle to 228 H.P., and Cummins diesel muscle to 743 cu. in. and 220 H.P. Frames, clutches, transmissions and axles have been strengthened to match. Swing-out fenders let you walk right up to the engine and service it fast. A BBC of 89¾" lets you put more load on less wheelbase, or pull a longer trailer. Those are two advantages of Dodge's cab forward design. Another: the cab simply can't go haywire, nor do you have to raise the roof to accommodate it. If you own a tilt-cab, you'll know what we mean. Toughen your fleet from a big choice of Dodge heavies. Trucks and tractors. GVWs from 19,500 lbs. to 53,000 lbs. GCWs to 76,800 lbs. Two other things to think about. The heavy-duty Dodge for your job is probably waiting your order today at a Dodge Truck Center. And now there's a 24-hour-a-day, seven-day-a-week ordering system for emergency parts. Delivery's soonest!

DODGE BUILDS TOUGH TRUCKS

Enter 74 on card, page 197

Enter 76 on card, page 197

Pass the salt....

from 2,000 feet below Lake Erie

...a job for USS Tiger Brand

Fairport Harbor Mine of the Morton Salt Company showing skip hoist at left and processing plant at right.

Rock salt discharges from the skip into a hopper and then flows on to a conveyor leading to the processing plant.

Skip hoist equipped with two Tiger Brand wire ropes. Two skips operate simultaneously—one discharges at the top while the other loads at the bottom.

The deepest salt mine in the United States is located at Fairport Harbor, Ohio, about 25 miles northeast of Cleveland. It taps a vast bed of salt 2,000 feet below the surface and extending far under Lake Erie. This is the first mine of its kind built in this country in the last 25 years. The shaft is deeper than the height of the Empire State Building.

Geologists estimate that the high-grade rock salt in this location will last over 200 years. The Morton Salt Company of Chicago, developers of the mine, aim to produce about 500 tons of salt an hour. All of it will be used for industries in the East and Midwest and for spreading on highways and sidewalks in winter.

USS Tiger Brand Wire Rope forms the vital connecting link between the salt bed and the surface. Two huge skips, shaped like rockets, have a capacity of 16 tons each and make 31 trips per hour. They are hoisted at a rate of 1,380 feet per minute by two Tiger Brand $2\frac{1}{8}$" dia. Special Mine Hoist Ropes 2,580 feet long. These ropes provide the strength, fatigue and abrasion resistance necessary for safe and economical service. To prevent corrosion from the salt, the ropes are thoroughly lubricated at the factory and are relubricated every month at the mine.

Why USS Tiger Brand is your best buy. Tiger Brand Wire Rope is designed by one of the industry's most capable staffs of wire rope engineers. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry. When you buy Tiger Brand you get the right rope for the job. And your installation is no further away than a phone call from experienced American Steel & Wire field service representatives.

For more information, write American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

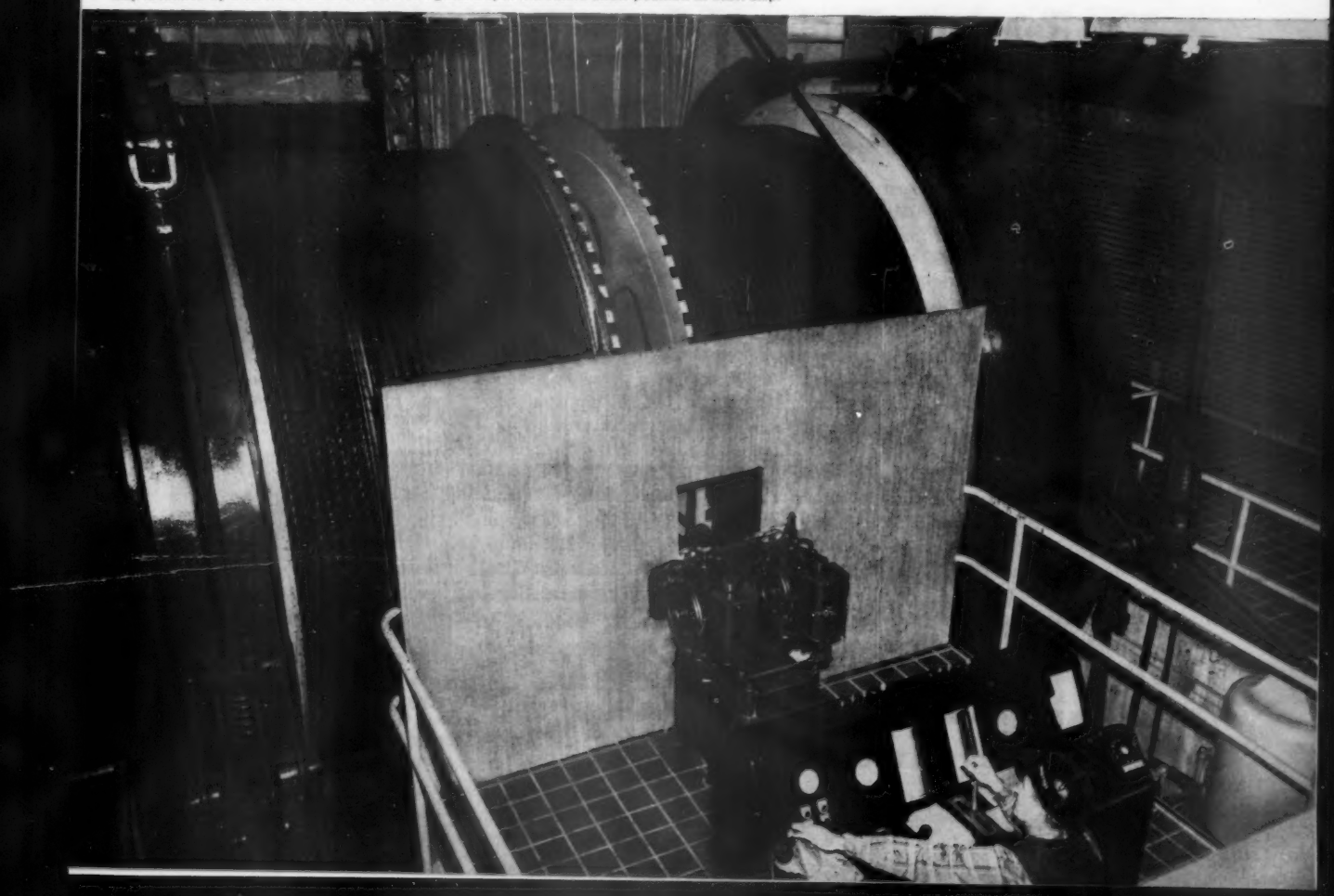
USS and Tiger Brand are registered trademarks

USS **American Steel & Wire Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad

Wire Rope

USS Tiger Brand Wire Rope on the huge 12-foot diameter skip hoist drums. Skip operator can tell when skip is loaded by a series of different colored lights. Depth indicators show position of each skip.



The Babcock Company, Kasota, Minnesota

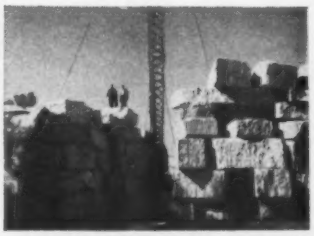
Bearings Replaced Every 11 Weeks... New Trojan HM Grease Extends Life to 18 Months!

Four generations of Babcocks have been producing "Kasota Stone." Today, Babcock is the largest producer of fabricated natural stones west of the Mississippi.

But Babcock had been having a problem with equipment on an important step in its production. The connecting rod bearings on the gang saws were burning out in less than three months. Seven different competitive greases were tried on these bearings and they continued to show an average life of only eleven weeks.

Cities Service Lubrication Engineer, Ray Brooks, was consulted and he recommended new Cities Service Trojan HM Grease. New Trojan HM contains molybdenum disulfide that has a strong affinity to metal. This causes it to adhere to the bearing surfaces even after the other lubricant has been squeezed out or washed away. Babcock lost only one of the eight bearings on the gang saw in the next year and a half. And that bearing had nearly run out its life term with the grease that preceded introduction of new Trojan HM.

The operating conditions encountered in quarries demand more of lubricants than almost any other type of operation. Shock loads, extremes in outside temperatures, water, dust and other contaminants demand high quality lubricants to safeguard your equipment and keep production up. If you have a grease problem... want to extend the period between servicing . . . call your local Cities Service office for full information on new Cities Service Trojan HM grease. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



Babcock's "Kasota" Stone can be found in buildings and monuments all over the United States.

Connecting Rod Bearing that formerly lasted only eleven weeks is now used for eighteen months and longer. Seven competitive greases were tried before New Trojan HM.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

The Editor's Page

1959 Safety Records Leave Room for Improvement

MOST of the returns are now in on the status of safety in 1959 in the nonmetallic minerals industries. The statistics available come from several unrelated sources and in conflicting and overlapping groupings, making it difficult to arrive at even general conclusions. As nearly as we can estimate, however, these industries as a whole had a sharp drop in accident severity in 1959 and a small but general increase in frequency.

In the U. S. Bureau of Mines' 1959 Sand and Gravel Safety Competition the 173 plants entered had an injury-severity rate of 1,232. This compares with 1,732 for 1958 and the 10-year average of 2,694. The injury-frequency rate of 21.10 was over the 1958 rate of 18.13 and only slightly below the average of 22.28.

The Bureau of Mines data for the Mineral Extractive Industries shows that for 5,174 sand and gravel plants the severity rate went down from 2,321 in 1958 to 2,213 in 1959, but the frequency rate went up from 18.64 to 20.33.

IN the National Crushed Stone Association's contest the 134 participants had an injury-severity rate of 3,436 days lost. This was well below the very high rate of 6,360 in 1958 and the 34-year average of 4,855. The injury-frequency rate of 18 compares favorably with 21 in 1958 and the average of 26. The mineral extractive industries data shows that the stone quarrying frequency rate for 3,054 operations dropped from 24.71 to 23.69 in 1959.

In the National Lime Association's 25th annual safety competition the 57 participants had an injury-severity rate of 2,283, the highest since 1953. The injury-frequency rate—13.72—was over the 12.58 rate in 1958 but far below the over-all average of 24.38.

The portland cement industry had an accident-severity rate of 1,249, which was well below the 1,428 figure in 1958. The frequency rate was almost stationary, 3.33, compared to 3.30.

In the National Slag Association's 1959 competition the 49 producing plants entered had an injury-severity rate of 3,061. This compares favorably with the 1958 rate of 3,963 and the 11-year average of 4,614. The injury-frequency rate of 12.43 compared favorably with 13.73 in 1958 and the over-all average of 16.12.

THE mineral extractive data for nonmetal mines, including most of the industrial minerals, showed an over-all decrease in severity and an increase in frequency. Increases in severity were shown by clay and fuller's earth, phosphate rock, and sulphur. Decreases were shown by the feldspar-mica-quartz, gypsum, potash, salt, and miscellaneous industries. Increases in frequency were shown by the feldspar-mica-quartz, gypsum, phosphate rock salt, and miscellaneous industries, and decreases by the clay, fuller's earth and potash industries.

Nonmetal mills, covering essentially the same group of industries, had an increase in severity from 1,457 to 1,699 and in frequency from 21.07 to 24.37.

The only definite conclusion that can be derived from the above is that there are still far too many operations in which safety receives little or no attention. Reasonable safety for all workers in these industries will never be achieved until every operator personally takes the necessary steps to make his operation safer.

Walter E. Trauffer

NOW SILENT, the old original plant and its wooden framework feed conveyor are being temporarily retained on stand-by status. Future plans call for its removal, but its underlying reclaiming tunnel is to be used for handling of particular materials.

Production Capacity Soars

Goal of extensive improvements: maximum size range, flexibility in crushed stone program

By BUREN C. HEROD

THIS QUARRY VIEW shows operations on the upper ledge, which primarily furnishes material for production of concrete aggregates. Hard shooting is standard practice, as evidenced by the material being loaded.

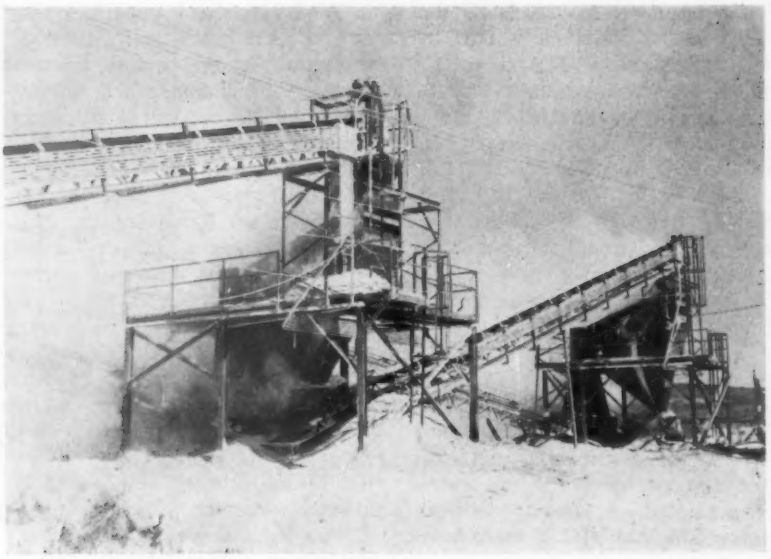
ANOTHER ON THE SPOT report

WHEN Pete Lien & Sons undertook last March the first and most extensive phase of a comprehensive over-all improvement program of their crushed stone operations at Rapid City, S. D., they proceeded under the premise of "first things first"—the first goal being the attainment of a wide product range with attendant blending flexibility.

Although greater production capacity was subordinated to this primary objective, the phase recently completed—a completely new secondary plant—actually resulted in nearly doubling the former capacity. The over-all operation can now easily handle 250 t.p.h. This rate is still well under the design capacity of the new secondary plant and load-out facilities, due to the fact that installation of new equipment in the primary phase was scheduled as a subsequent part of the general improvement program.

However, the primary goal was quite successfully reached. Designed by Power Transmission, Inc., around basic proposals of management, the new plant section will deliver materials at the rate of more than 300

THESE NEW SCREENING INSTALLATIONS of the secondary plant, along with secondary and tertiary crushing circuits, represent a 100 percent gain in processing capacity. The screens are air-spring-mounted.



at Black Hills Operation

t.p.h. to virtually any specification or blend, and these can be loaded out at the rate of more than 500 t.p.h.

Despite its importance to the future prospects of the company, this extensive improvement project is not the first major step of its type undertaken in the firm's history—although the most striking—nor obviously, in the progressive attitude of its management, will it be the last.

Ample evidence of the forward strides made by this energetic firm is found in the fact that annual sales of $16,000 in 1945, the year of its organization, had soared nearly 500 percent to more than $700,000 at the end of 1959. In the background of that exceptional growth were a number of important steps leading up to the recent, more extensive, project.

Pete Lien, originally a construction contractor—along with his sons Chuck and Bruce—became an aggregate producer by design, the design being to assure himself of a consistent supply of materials for the contracting activity. Operations in an antiquated plant, on which he was relying for necessary aggregates, proved too erratic. When the owner of that plant offered to sell, the Liens accepted the offer, and proceeded to put the small operation on a consistent production basis.

Seven years ago the first step toward expansion was made, with the installation of a larger primary crusher and also a secondary unit. The following year another secondary was added. Shortly thereafter, replacement of obsolescent quarry equipment was initiated, and by the end of 1959, a new shovel, drill and compressor, and heavy-duty haulage trucks had been acquired.

The next step was the erection of the modern secondary plant which was placed in operation in July. This unit includes completely new screening, reclaiming, and load-out installations with modern interlocked, remotely-controlled flow.

Plans have already been laid, however, for further improvements in the near future. These pending refinements, as noted earlier, have been held in abeyance while the basic objective—processing flexibility and product range—was being reached. The next steps will comprehend the second major goal, capacity. These improvements will include installation of a larger primary breaker, to realize the full potential of the new secondary plant.

The primary will be set in the quarry and will be completed by the provision of a surge for independence of primary and secondary phases. At the other end of the flow a rinsing screen and pug mill will be added to the load-out installation, for special processing.

Basic markets, which the new operation was built to service most effectively, include ready mixed concrete plants, aggregates for highway concrete and base courses, and military construction in the area—largely runways, ramps, and other structures at Ellsworth Air Force Base. Local customers, particularly in and around rapidly expanding Rapid City, are served by truck shipment with the Liens' own truck fleet. More distant shipments, consigned to points as far as 200 miles away in all directions, are originated on the Northwestern RR.

In the tract of more than 1,000 acres acquired with the original plant, the limestone formation being worked has a rather uniform depth of about 40 ft., and is underlain by shale. Exposed in the "Racetrack," an outer valley surrounding the Black Hills uplift, the formation has only a slight dip, which poses no problem in quarrying. (*Turn page.*)

Due to the variance in lamination and coloring, the stone is removed from two benches. The top 24 ft., which exhibits more massive strata, is recovered on one bench and is used primarily in production of concrete aggregate. The bottom 16 ft. of the formation is more thinly laminated, and although equal to material from the higher strata in strength, it is used primarily in producing road base materials and railroad ballast.

In drilling the top ledge to its 24-ft. depth, 3-in. holes are sunk on a 9- by 13-ft. pattern with a Chicago-Pneumatic Tracdril. Usually Brunner & Lay Rok-Bits are used, and service penetration rates have reached 50 f.p.h. During the peak demand months, 100 or more holes are drilled for one shot; about 60 are sunk for each shot in the slower season.

Drilling on the lower ledge may be done on the same pattern as that used with the upper one, or it may be opened slightly. In case of the latter, the explosive charge is reduced by several pounds.

Holes are charged with Phillips ammonium nitrate prills, which are mixed with fuel oil in the ratio of 96/4. The mixture is made by pouring the oil over the prills in the bags; and it is then dumped into each hole up to the mid-point. Here 75 percent Atlas dynamite cartridges are inserted as primers, and then topped with more prill-oil mixture.

One primer is used per hole, and all are set off with Atlas Rockmaster caps. The total charge in each blast hole in the upper ledge is approximately 62 lb. In the lower ledge, it is about 20 percent less. "Hard" shooting is standard practice, aimed primarily at minimizing the load on the primary crusher. With yields of nearly 3.5 tons of stone per pound of explosive on the upper ledge, the current daily plant production rate requires the equivalent of the material brought down in about seven blast-holes. Slightly less blast-hole "consumption" is required on the lower ledge, where the average yield is about 4 tons of stone per pound of charge.

Broken rock, loaded out by a 1½-cu. yd. Bucyrus-Erie 38B shovel, is hauled to the plant area in a pair of International 65 payhaulers. Haul road grades throughout the quarry area are in favor of the load. At the present primary crushing installation, which adjoins the plant site but will later be set up with larger equipment farther into the quarry, the trucks dump into the hopper of a 42-in. by 10-ft. Cedarapids apron feeder. This unit now feeds a gyratory which reduces the stone through a setting of about 4½ in. The future replacement will probably be an impactor.

Primary crusher run is conveyed to a scalping tower on a 30-in. by 100-ft. belt which, due to its width, is run at a rather high speed. When the future primary installation is made, a wider belt will be provided.

Scalping is done on a 4- by 12-ft. Allis-Chalmers double-deck Ripl-Flo that is normally fitted with 2- and ½-in. opening cloth on the top and bottom decks, respectively. In effect, the scalping operation separates fines which are dropped into an underlying bin of driveway and base material, etc. Both retained fractions are chuted to the secondary crusher, an 848 Hydrocone. Adjacent to this crusher is a 636 Allis-Chalmers Hydrocone, involved primarily in tertiary reduction of reclaimed products, as described later.

The above equipment, plus the primary crusher and scalper are the only units retained from the old plant. From this point on, the installation is completely new, and the primary processing and material-handling equipment used throughout includes Allis-Chalmers air-spring mounted screens; Stephens-Adamson conveyors (all with 36-in. belts except on stockpiling units); Jeffrey feeders; and a Symons screen.

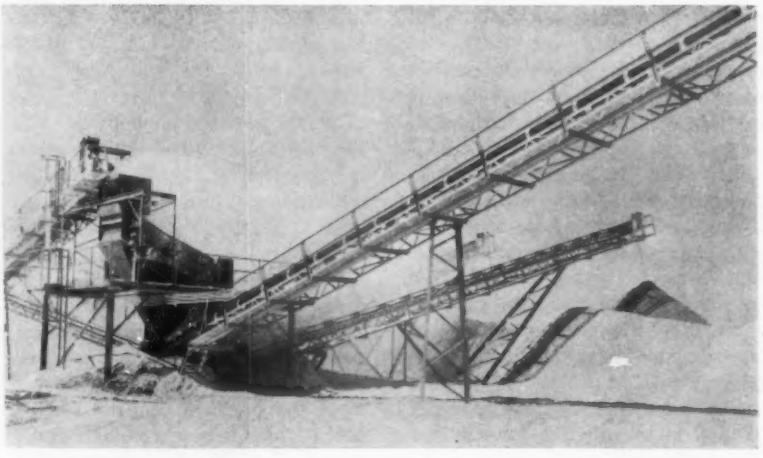
None of the conveyors have take-ups; only nylon web carcass belting made by American Rubber Company is used so that stretching will not be a problem. Although this type is more expensive in original fitting, management feels that it is less costly in the long run.

Material discharged from the 848 secondary crusher, after reduction through a 2-in. closed side setting, is carried on a 127-ft. conveyor to the primary screen tower. The screen at this point is a 5- by 12-ft. double deck unit mounted at 20 degrees from the horizontal. Separation of 1½- and 1-in. fractions is made, and these are chuted to separate stockpiling belts that discharge onto piles above a reclaiming tunnel.

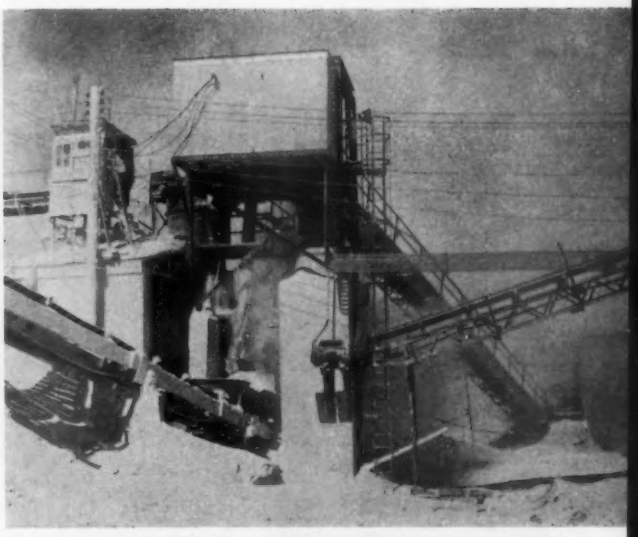
Minus 1-in. throughs are received on a 100-ft. conveyor for transfer to the secondary screening stage. Here they are received on a triple-deck 5- by 14-ft. screen, also installed at 20 degrees. From top to bottom, separation is made on ¾-, ⅜-, and ¼-in.-opening screencloth. The four fractions are separately chuted to the respective stockpiling conveyor for discharge over the reclaiming tunnel.

The latter, 218 ft. long, and 10 ft. in diameter, was built with No. 10 Armco liners. It houses a battery of 12 Jeffrey feeders—two installed under each of the six over-

A VIEW OF THE DOUBLE-DECK PRIMARY screen and the stockpiling conveyors (background). In the right foreground is the conveyor connecting with the secondary screen.



THE PRESENT PRIMARY CRUSHING INSTALLATION seen here will be replaced by a newer one incorporating a larger breaker. The planned installation will be farther from the plant and will supply a plant feed surge. With larger primary capacity, the full potential of the new secondary plant can be realized.



SCALPING, PLUS SECONDARY AND TERTIARY REDUCTION are housed here. The conveyor at the left supplied the old plant; that at the right leads to the new screening setup. In the background is one end of the reclaiming tunnel and a conveyor returning material to the crushers.

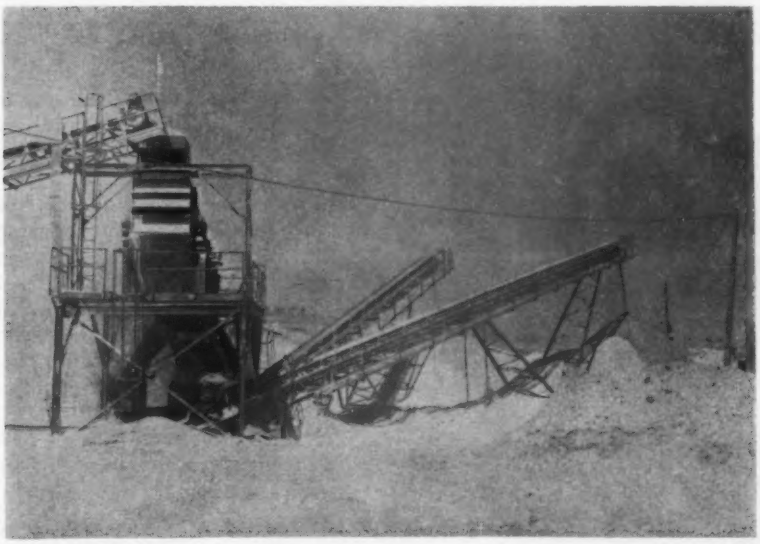
lying piles. The 228-ft. c-c reclaiming conveyor is reversible, and can deliver any product or combination to the belt feeding the load-out tower, or start it back toward the tertiary crushing stage. All feeders except one discharge to this reclaiming belt. The exception is one of the two units which is installed below the pile of 1½-in. stone. This feeder delivers only to a 50-ft. conveyor that travels in but one direction, and discharges at one end of the tunnel onto a 79-ft. conveyor connecting with the secondary and tertiary crushers.

Thus, while the main reclaiming belt is starting various products toward the load-out operation, the smaller belt can continue to feed the recrushing circuit. At the latter point, the reclaimed material may be fed to either the 636 or the 848 Hydrocone, or to both simultaneously.

However, since the larger unit is carrying a good load in secondary reduction of the scalper fractions, the 636 generally receives most of the reclaimed stone for tertiary crushing through a 1-in. closed side setting. Both of these crushers are choke-fed, and the discharge is arranged to direct the two flows toward each other into a common stone box. This reduces impact loading on the belt feeding the primary screen tower.

In the opposite direction of flow of material reclaimed from the stockpiles, the reclaiming belt discharges to a 200-ft. conveyor connecting with the load-out tower. All material in transit on the latter belt is weighed by an ABC's Transportometer.

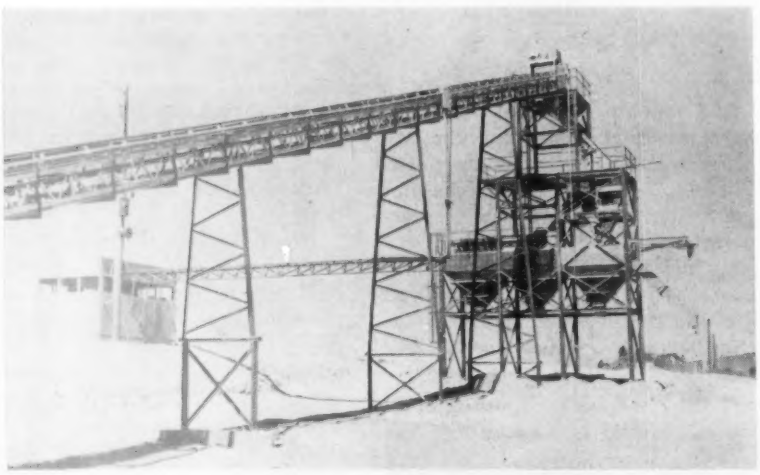
At the top of the load-out tower the materials are discharged into chutes leading to the three 18-ton bins, and to a 3- by 12-ft. single-deck Symons screen. This screen is primarily fed fines, and delivers clean ¼ x No. 8 chips that have wide acceptance among concrete masonry producers. Dust removed



THE SECONDARY SCREEN is a triple-deck unit. At the right are two of the six stockpiling belts in the screening systems which discharge material over a 218-ft. long reclaiming tunnel.

ALL MATERIAL IN TRANSPORT on this belt from the reclaiming tunnel to the load-out tower is weighed and recorded by the scale instrument (top).

A BATTERY OF 12 FEEDERS are housed in the reclaiming tunnel. From this point on, the system can handle more than 500 t.p.h. of material for delivery to the loadout installation.



Above:
THE LOAD-OUT TOWER was built high to accommodate a future screen and pugmill below the feed conveyor discharge level. The installation services both truck and rail loading. At the left is the secondary plant control station.

Left:
REGULATION AND BLENDING control of the entire flow from reclaiming tunnel feeders to load-out bins is housed in this control room. Another control station handles the remainder of the new operation from scalping to stockpiling conveyors.

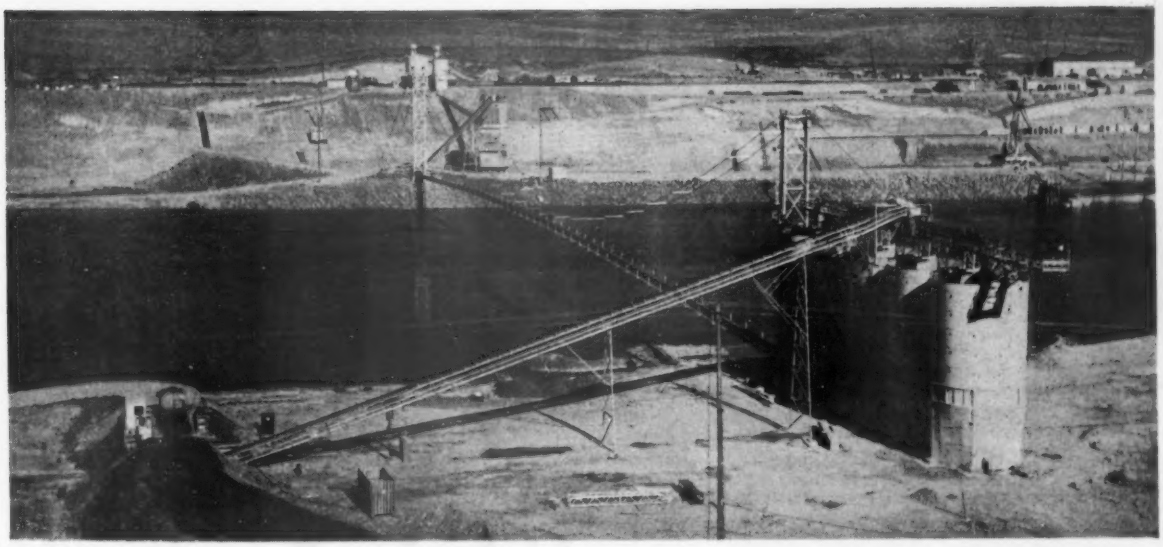
is trucked back to a blending bin for discharge onto the loadout feed belt as desired.

Space has been provided on the load-out tower, below the feed belt discharge point, to accomodate a pug mill for future production of stabilized base material. Addition of a rinsing screen is also planned, for removal of dust from any specified finished products before they go into the underlying loading bins.

The reclaiming and load-out circuit can handle over 500 t.p.h. with ease; and it accommodates both truck and rail equipment. Regulation of flow and blending control are housed in a control room near the load-out structure. Starting with the reclaiming tunnel feeders, the entire subsequent operation, with only one exception, is regulated from this point. The exception is the one feeder that delivers plus 1½-in. stone to the short reclaiming belt. These units, and all processing stages from the scalper to the stockpiling conveyors, are regulated from a panel on the secondary crushing installation. Rheostat settings of all feeders are checked by ammeters in the control points. Production control is also aided by the use of an intercom system installed throughout the plant.

Another scheduled project which will increase the operation's flex-

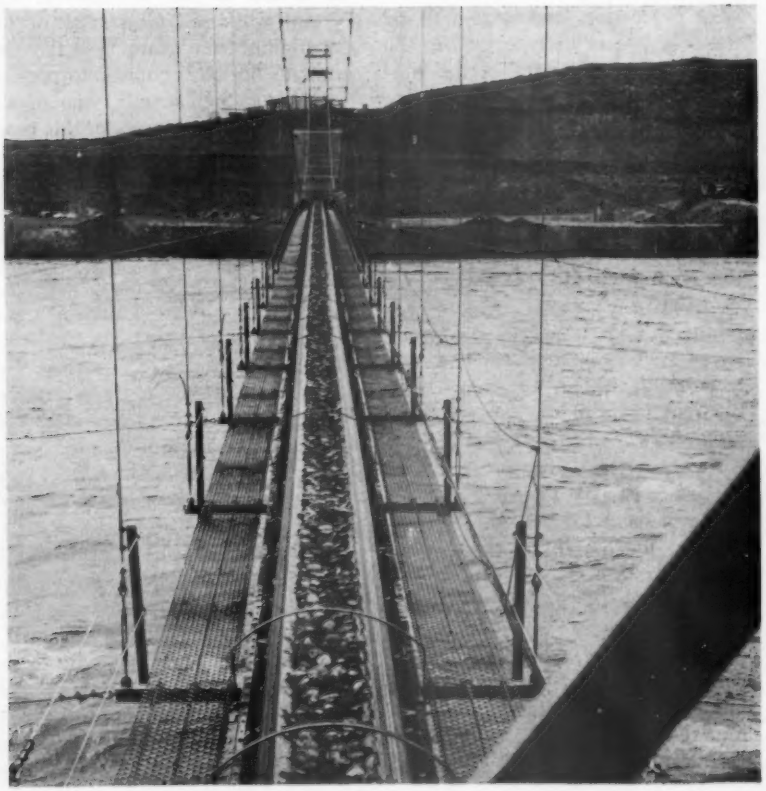
(*Concluded on page* 92)



This view of the Atkinson operation shows the receiving hopper at the lower left and the five 1,000-ton aggregate silos at the lower right. Across the river, the 930-ft. suspension bridge conveyor transfers to another belt leading to the rinsing screens in the structure near the riverbank. At a higher level (along the spur track) is the concrete plant, with the cement and pozzolan silos.

Wire Rope Bridge Supports Conveyor For Aggregates

By HARRY F. UTLEY



ANOTHER ON THE SPOT report

AFTER the Guy F. Atkinson Company was awarded a $20,000,000 contract on the Ice Harbor Dam and lock project on the Snake River near Pasco, Wash., the firm set about solving a number of problems.

One of the most important of these concerned the method of transporting aggregates from one side of the river to the other. The Atkinson contract covers work on the north side of the river. (Construction on the south side, undertaken by another contractor, is now practically completed.)

The source of aggregate supply, however, is on the south side of the river, about 6 miles distant from the

(*Concluded on page* 95.)

A closeup of the hanging conveyor and the 30-in. by 930-ft. belt conveyor shows the details of its construction. This view looks toward the south bank of the river.

Lester Crown, president, Marblehead Lime Company, which was the host organization, welcomed the group to Chicago and to the Marblehead facilities.

• KILN FIRING, EFFICIENCY, REFRACTORIES SCRUTINIZED AT

N.L.A. Operators'

ANOTHER ON THE SPOT REPORT

ANOTHER peak attendance level recorded in the recent annual operators' meeting of The National Limestone Association testified to the consistently high quality of a program dedicated to aiding lime plant operators with their complex problems.

Held at the Conrad Hilton Hotel, Chicago, September 29—October 1, the session was attended by approximately 150 representatives of U. S. operations from coast to coast, plus Canadian and English members and guests.

Complementing individual papers and panel discussions on operating problems by widely-known production men, were a number of presentations by engineers and specialists covering new equipment developments, industrial markets, research, improvements in processing and equipment technology, and a review of operations by industry colleagues overseas. Another highlight was a regular feature of these meetings—the presentation of safety awards honoring the records of various member companies.

A popular adjunct to the business part of these sessions is the plant tour. This year the operators were taken through the South Chicago plant of the host company, Marblehead Lime; to the Acme Steel Company operations at Riverdale, Ill., which incorporates basic oxygen steel processing, and is said to be the only one of its type; and to the huge Thornton quarry of the Material Service Corporation.

The outstanding job done, and the effort expended by the arrangements committee in organizing such an excellent program merits recognition. C. C. (Cy) Addams (Marblehead Lime Company) again headed this committee. He was assisted by A. M. (Tony) Caite (Basic Incorporated), Clarence LaLiberte (Cutler-Magner Company), and Robert S. Boynton (N.L.A.), who made up the remainder of the arrangements group.

Plant Tours

Marblehead Lime Company was host for the tour of its South Chicago operation, as well as for the group luncheon preceding a visit to Acme Steel's works and the Thornton quarry. At South Chicago, where Marblehead has three rotary kilns, the group was permitted to tour the facility at will, and to observe at length any particular phases of primary interest to the individual operator.

The next stop was Acme's unique plant, which incorporates the cupola-oxygen converter process—described as a first in this hemisphere. The group witnessed all phases of the operation, from charging of the continuous hot blast cupolas to pouring of ingots. Significantly, one of the most important aspects of this modern 450,000 ingot/ton steel plant, is its extensive dust collection system, which represents an investment of more than $1,000,000, according to company officials.

At the Thornton quarry, the group was conducted through the new primary crushing installation, where a large gyratory was recently installed, and also into the extensive quarry area, to see loading operations. Particular interest was stimulated by the large electric shovels, one an 11-cu. yd. unit, and the 50-ton capacity quarry trucks.

The day set aside for plant tours was sandwiched between the two days of business sessions. At the opening meeting, for which C. C. Addams was presiding officer, the group was welcomed to Chicago, and to his firm's facilities by Lester Crown, president, Marblehead Lime Company. Presiding officers of sub-

By BUREN C. HEROD

T. C. Miller, right (National Gypsum Co.), winner of the Azbe Lime Award, receives his award check from Victor Azbe (Azbe Corporation). Mr. Miller's award winning paper dealt with a study of reactions between calcium oxide and water.

Meeting

sequent sessions were Clarence LaLiberte, and A. M. Caite.

Refractories

"Prescription design," involving "prescription refractories," is now a basic factor in modern refractory applications, as pointed out by O. M. Wicken, Harbison-Walker Refractories Company. Improved production techniques and capacities in the lime industry have required the development of specific refractories to meet the wide range of conditions encountered in calcining.

Referring to a lime-silica-alumina phase diagram, Mr. Wicken stated that the individual oxides in their purer forms melt at higher temperatures than any mixtures of the three. The latter form the basis of melts encountered in calcining. An increase in alumina in a mixture elevates the critical temperature between solid and liquid state, he noted.

C. C. Addams (Marblehead Lime Co.), right, headed the program committee that arranged another outstanding meeting schedule. In addition to Marblehead facilities, the group also toured the Acme Steel Co. operations at Riverdale.

The advances in shaft kiln operations with higher production rates have made it tougher on refractory brick — through abrasion, impact, and spalling. Another factor has been forced draft. The refractory lining should also be insulated from the shell with brick or castables. With these points in mind, it is apparent, the speaker pointed out, that shaft kiln refractories must be carefully designed for application in specific zones, to withstand the wide variation in stresses found in charging, preheating, and calcining sections.

Rotary kilns present similar problems, *i.e.*, different stresses in various zones, and require the protection of refractory design comparable to that of the shaft units. However, the speaker emphasized, the different refractory brick throughout a calciner, regardless of zone, must have a comparable life. In other words, there must be a "balanced" lining, so that it is not necessary to

shut down for repairs to a given area after another area has already been repaired.

Another factor that must be considered in designing a refractory lining, Mr. Wicken said, involves the differences in kiln types. These variations dictate a different refractory pattern from one kiln to another. Further, two similar kilns would require a different design, although processing an identical stone, if production rates, temperatures, etc., were different.

In addition to the more standard applications of refractory brick, their growing use as internal construction media has been noted; for example, in dams, and heat exchanger sections. With respect to the latter, it was indicated that recently-developed bonded construction at each end of an exchanger precludes raveling of the first courses at these points.

In an interesting discussion presented by Ray A. Witschey, A. P. Green Fire Brick Company, on *Monolithic Refractories in Lime Production,* it was pointed out that there has been a marked increase in the use of this material by the lime industry in the last 20 years. Although products and techniques have been improved during that period, it is felt that the primary factor in the gain has been better service life.

At one time refractories were defined on the basis of metallurgy, *i.e.,* acidic, basic, or neutral, the speaker pointed out. Next popular definition was based on material content. The present practice, however, is to define a refractory on the basis of form.

Essentially, there are three installation methods pertinent to modern refractory forms, Mr. Witschey said —solid masonry, suspended masonry, and monolithic. The first system developed hand-in-hand with the similar techniques of the brick industry. Suspended masonry construction started with arches and comparable forms as tile refractory. The development of monolithic installations, in which the refractory is formed as a unit solid mass (as opposed to individual blocks), was more closely related to advancing installation techniques.

The manufacture of fire clay plastic refractories was the first step in monolithic installations developments. Subsequently, castables were designed, not only to a broader use than the plastics, but for specific methods of application. Equally important, they were designed to meet the different physical conditions of abrasion, impact, and temperature stress found in specific areas of application in kilns.

A. M. Caite (Basic Incorporated), right, was another member of the operating and program committee, which also included Clarence LaLiberte (Cutler - Magner Co.) and Robert Boynton (N.L.A.). At the left is Max Muller (vice-president, operations, Basic Incorporated).

Mr. Witschey briefly reviewed the various methods used to place monolithic linings. Ramming with a pneumatic hammer is the method used to place the plastic refractories. In casting, the material is poured in place in much the same manner as concrete, and often with comparable forms. Air placement guns, first used about 25 years ago, are used in gunning, a growing practice. Troweling is involved primarily when a relatively thin application is being made.

The secret of any successful installation, it was emphasized, lies in the anchorages, which have probably received as much research attention as the refractory material itself. The highly successful types now used were illustrated by Mr. Witschey in a series of slides. Also shown was the wide range of application of this material, including kiln hoods, coolers, ducts, dust collectors, stacks, dryers, kiln chain sections, and kiln nose rings.

Coal Firing

A panel headed by moderator A. M. Caite, and comprised of Lee Niems (Marblehead Lime Co.), Clarence LaLiberte (Cutler-Magner Co.), and Virgil Tadsen (Gibsonburg Lime Products Co.) discussed factors relevant to firing of coal in rotary lime kilns.

Along with a short resume of the chemistry of combustion of fuels, Mr. Niems discussed the combination coal-natural gas firing in Marblehead's kilns. The combination provides many inherent advantages of both fuels, and eliminates some disadvantages of each. For example, the combined fuel minimizes ring formation, which gas alone might propagate. At the same time, gas increases ease of control.

In the installation described, the fuels are combined by admitting the gas stream, *via* valving, directly into the coal stream in the burner pipe.

A system of kiln ring removal in a coal-fired kiln was detailed by Mr. LaLiberte. The system involves rapid air cooling of the ring by directing a blast of cool air on it at maximum volume and rate. The stresses due to rapid cooling lead to cracking. When a burner pipe is offset, the blast is most efficient, since it may be directed straight at and on a ring.

The success of the system described is apparent in the fact that over a three year period in Mr. LaLiberte's plant, the consumption of kiln gun ammunition dropped 90 percent. Preliminary steps in the ring removal include reducing kiln speed to the minimum, shutting down the coal mill feed, adjusting

the tempering tee on the air supply to the coal mill, opening all access doors on the firing hood, opening the butterfly damper or setting the fan at maximum speed, and turning off the damper or shutting down the cooler fan.

Mr. Tadsen discussed various points pertinent to pulverized coal and its combustion. He noted that a coal particle occupies only 1/100th of the volume of air required for its combustion, and the rate of the latter is dependent on the surface area available on the particle.

To take full advantage of inherent combustibles, rapid ignition is mandatory, he added. Further, coal should be selected on the basis of its reactivity and also its content, in order to minimize formation of coal-lime-ash rings.

Basic Oxygen Steel

The steel-making process described by E. R. Richards (Acme Steel Co.) is one that originated in Europe and was first used in this country about five years ago. As installed at Acme's Riverdale plant, the process involves hot blast cupolas, oxygen converters and lances, plus certain phases on which publicity is not permitted, and which contribute to the fact that this is the only one of its type in this hemisphere.

Acme entered the steel production field because, as a former customer for strip steel which it then fabricated, it found former supplying mills on the verge of doing similar fabrication.

Steel for deep drawing in Acme's fabrication must have a low sulfur content, and should also be low in residuals. These two factors led to the investigation of the basic oxygen process. Too, flexibility in charging is mandatory when scrap is used in steel making, Mr. Richards commented, and the cupola charging in this system readily conforms.

While the process differs in many phases from the more common blast-furnace-open-hearth methods, most of the materials involved—including lime and limestone—are mutually applicable. The new method has two special advantages: (1) steel can be made in relatively small amounts quickly (up to 75 tons in 40 minutes), which permits production of many varieties and grades daily; and (2) there is a gain in volume per dollar of capital cost. Inherent compactness of the process, coupled with automation and lower manpower requirements, also contribute to favorable costs.

Oil-Fired Shafts

Stating that there are currently no oil-fired (Azbe type) vertical kilns in this country, Victor J. Azbe (Azbe Corporation) declared that the predicted shortage of natural gas fuel within the next 25 years will lead to accelerated studies on the use of oil as fuel.

Despite the fact that natural gas is a fuel that is easy to control, it has a number of liabilities, Mr. Azbe said. These include water of vaporization, narrow ignition range, low flame velocity, and low carbon/hydrogen ratio. In addition, the flame goes out easily, it was stated, and the chances of improper mixing with air are greater.

"It has taken us a long time to learn how to burn oil in vertical kilns," Mr. Azbe stated. However, progress has been made, and the recent successful conversion of a Norwegian operation was cited. Prior to the change it had been estimated that the kiln in point would deliver 100 t.p.d.; it actually produced 175 tons at a higher fuel efficiency than expected.

Using a series of slides, the speaker illustrated a number of applications and installations showing oil burner arrangements surrounding the calcining zone, combination oil-gas producer firing, and an oil-fired gas producer.

Ivan F. LeGore (director of safety, P.C.A.) presented solid evidence as to why safety makes sound economic sense, as well as being a moral obligation.

G. E. Bessey (Chalk Lime and Allied Industries Research Association, England) reviewed production methods in the English chalk lime industry.

The Azbe Lime Award was another highlight of the meeting in which Mr. Azbe took part. He had the opportunity of personally presenting T. C. Miller (National Gypsum Co.) with a $1,000 check from the award trust for the most outstanding technical paper on fundamental lime research or production technology. Mr. Miller's research was the subject of a paper entitled *A Study of the Reaction Between Calcium Oxide and Water*. Synopses of the paper are available from the N.L.A. office.

Air Pollution Control

As aptly put by David Wheeler (Kaiser Engineers), "Air pollution control—is a very broad field—including many things in its application, even politics."

Collectors are the heart of air pollution control, he stated, adding that such systems must handle large volumes of gas, total gas weight amounting up to four times the weight of the product in process.

A review of several types of control equipment by distinct groups was presented. *Inertial collectors*, which change the direction of gas flow, were described as generally used for primary units ahead of a secondary. *Cyclonic equipment*, said to be probably the most widely used, operates on selective separation of

particles. It was indicated that such installations have a low cost and good efficiency. Clogging and corrosion due to some materials in process were said to be occasional problems.

Scrubbers, somewhat difficult to evaluate on the basis of pressure drop, particle size, etc., must be considered in the light of many factors aside from efficiency in investigations of their potential.

Among the several types of *cloth filters,* a common problem was said to be the removal of dust from the bags. Various systems are employed for this, including shaking, shock wave, and reverse jet.

Application of *electrostatic precipitation* dates from Cottrell's first unit in 1912, Mr. Wheeler said. Although they are fairly expensive, and require the services of skilled personnel for repairing of the electrical components, they can be sized to desired efficiency, may operate wet or dry, and on either vertical or horizontal gas streams.

It is often advantageous, it was added, to use different types of collectors in series, *i.e.,* cyclonic equipment ahead of precipitators, particularly on high dust loads.

Improved Rotary Efficiency

"The operator of a rotary kiln lime plant . . . is mainly interested in producing lime at the lowest possible cost." To meet that fundamental goal, C. B. Ellis (F. L. Smidth Co.) added, the rotary must be operated most efficiently.

As a preliminary to his discussion on various methods of improving the efficiency of rotary lime kilns, Mr. Ellis pointed out that these units, despite their advantages as continuous processing media, are not necessarily the best in terms of thermal efficiency.

Essentially, their relatively low thermal efficiency is due to heat lost in exhaust gases, heat contained in the product, and radiation. Heat-saving devices developed to recover some of this loss include stone preheaters, heat exchanger systems, and coolers.

The work done and thermal efficiency in a standard kiln without any of the above refinements was in drying, preheating, and calcining of the feed with a thermal efficiency of about 36 percent. (The example involved a plain, coal-fired kiln of given length which is fed stone with about 5 percent surface moisture, and has a heat input of about 8,600,000 B.t.u.'s per ton of lime.)

Representatives of two of the 1,000-day safety award winning operations which received certificates at this meeting are Oreste Brazzale, left (Rockwell Lime Co., Manitowoc, Wis.); and John Lanham (Thornton plant, Marblehead Lime Co.).

Nothing can be done about the heat loss due to calcining, it was pointed out. However, proper sizing of the feed stone can prove beneficial to thermal requirements. Similarly, although not much can be done about the heat required for drying of wet feed or coal fuel, the cost of providing protective storage for these raw materials could well be weighed against possible fuel savings.

Heat contained in dust loss is relatively small, Mr. Ellis noted, but that due to radiation from the shell is about 16 percent of heat input. To reduce this loss, insulation of the shell must be considered. External insulation in both the firing and upper zones poses serious problems. Alternatives described include an insulating refractory lining, refractory lining backed up by insulating lining, or a full lining of 9-in. refractory brick.

The recovery of heat from the product is another important objective. Several methods were noted, including rotary, grate, contact, and planetary coolers. The first three of these have varying degrees of heat recovery efficiency, and certain disadvantages from the standpoints of installation, operation, and maintenance. The fourth, however, was described as having the advantages of being an integral part of the kiln, as well as providing an excellent heat transfer for preheating secondary combustion air (up to 1,000 deg. F.).

Heat lost with products of combustion and liberated CO_2 represents the greatest loss in a rotary; it is slightly higher—at 36.5 percent—than heat required for calcining. This, then, becomes the major goal in heat recovery.

This goal has been reached with the development of heat transfer devices for installation inside and outside the kiln. The former involves metal or refractory heat exchanger cross systems, and the latter an external stone preheating system (of either the stacked tower or traveling-grate type) ahead of the kiln.

Improper fuel combustion contributes considerably to poor thermal efficiency, Mr. Ellis stated. This condition can be rectified only with the use of continuous gas-analyzing/recording equipment, or by periodic checking with an Orsat apparatus.

A detailed description of a foreign installation was presented as an illustration of boosting production in existing kiln equipment. In this project, the installation of a traveling grate preheater (and a few minor changes to the kiln lining) resulted in a 100 percent jump in production, with approximately 33 percent drop in B.t.u. consumption.

In summary, the discussion indicated that the previously mentioned plain kiln, if provided with heat exchanger, planetary cooler, and insulating lining, would realize a drop in B.t.u. consumption of

slightly more than 30 percent, and have a thermal efficiency of about 54 percent. Further, a shorter kiln than the above example, but equipped also with an external preheater, would have a comparable fuel consumption, and would represent about the same total installation cost.

English Chalk-Lime Industry

In a discussion of the English lime industry, G. E. Bessey (The Chalk Lime and Allied Industries Research Association, England) noted that production in the United Kingdom is from both stone and chalk, and producers of each have separate trade associations.

The Chalk Lime group, for which he is director of research, has an extensive research program under way on fuel efficiency and heat balance measurements, quality control, standardization of specifications, potential industrial markets, soil stabilization, and potential building applications. The association is not engaged in promotion, but concentrates on technical assistance.

Slides were shown illustrating a number of plants using chalk, from formations up to 1,500 ft. thick, as raw material. Mixed feed kilns were said to be the most common for chalk calcining, and the moisture content of the chalk (up to 25 percent) sometimes poses a problem. In some installations the coke in the mixed feed is augmented by introducing coal farther down the shaft. Hydration, packing, and loading were described as similar to those operations in this country, and the growth of bulk truck haul of quicklime was mentioned.

Safety

"Safety makes good sense . . . (and) "accidents are waste at its worst," said Ivan F. LeGore (director of safety, Portland Cement Association) in opening a penetrating review of accident prevention.

Despite the fact that safety makes good *business* sense also, the toughest problem in safety education is getting the point across to the smaller companies which can possibly benefit the most. Apparently considering safety programs a frill that only the larger firms can afford, the operators of some small businesses are seemingly ignorant of the significant cost savings inherent in an effective safety program.

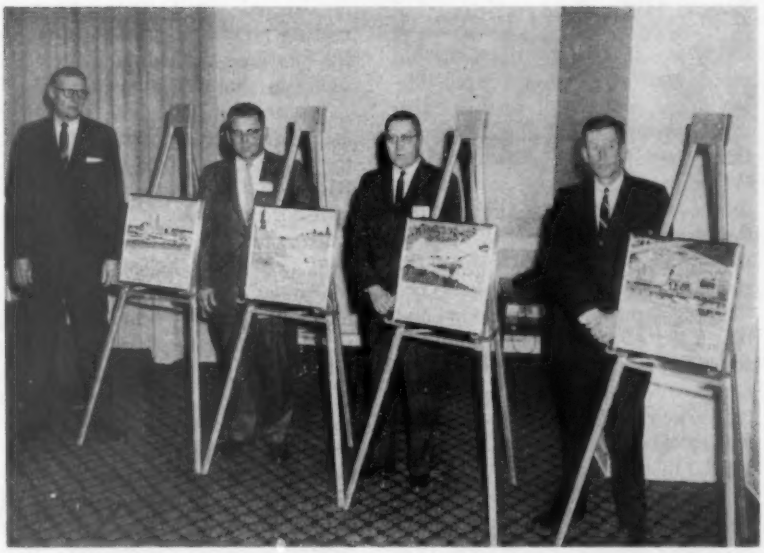
Ironically, the small operation which can least afford to lose ground in stiff business competition is generally the one with higher accident rates, and consequently high insurance rates—frequently with severe effects on narrow profit margins. In sound planning, safety is the chief concern of every executive since it materially adds to productivity.

Mr. LeGore emphasized further that "safety makes good *social* and *moral* sense." Good safety habits created on the job by industrial safety programs will transfer to outside activities. Safe conduct is mature conduct, is a P.C.A. slogan which recognizes the fact that safety consciousness means thinking of the other person, as well as oneself.

"Ignoring the other person's safety," the speaker pointed out, "is just as immoral as armed robbery."

In closing the program, Ken Gutschick (N.L.A.) presented awards to the 23 winners of the N.L.A. Certificates of Safety for 1959. He noted that the previous high in the last 25 years, was 17. In addition, 7 operators qualified for 1,000-day awards last year—an impressive figure, in view of the fact that there has been a combined total of just 20 winners for all earlier years.

Leaders in all four groups of the competition were presented with the *Rock Products* trophies, in addition to the certificates. The winning plants were, respectively, Genoa, Ohio (U. S. Gypsum Co.); Diamond Springs, Calif. (Diamond Springs Lime Co.); Bellefonte, Pa. (National Gypsum Co.); and Thornton, Ill. (Marblehead Lime Co.). The 1,000-day award winners who had not previously received their certificates were Rockwell Lime Co., Manitowoc, Wis., and Marblehead Lime Co., Thornton plant.



Safety trophies were also awarded to representatives of the top plant in each category of the safety competition. The winning operations were: Genoa plant, Genoa, Ohio (U. S. Gypsum Co.); Diamond Springs plant, Diamond Springs, Calif. (Diamond Springs Lime Co.); Bellefonte plant, Bellefonte, Pa. (National Gypsum Co.); and Thornton plant, Thornton, Ill. (Marblehead Lime Co.).

The Missouri Valley Limestone Company, Oakland, Iowa, has opened a quarry nine miles southwest of Atlantic, Iowa.

A limestone calcining plant, with a monthly capacity of 250 to 350 metric tons, has been constructed on the island of Bonaire, in the Netherlands Antilles. It will operate under the name The Bonaire Lime Factory, N. V., and represents an initial capital investment of $47,700.

Black Hills Operation

(*Concluded from page 84*)

ibility will involve a part of the old plant. Below the latter is a reclaiming tunnel which will be utilized in a new system for handling only the three basic road base materials. When the old plant is torn down, the base course blends drawn from the stockpiles will be delivered to the conveyor now leading to the secondary and tertiary crushers; but the flow will by-pass those units and be placed on a new conveying and stacking system. The latter will discharge into piles above the old tunnel, which will then be used solely for recovery and loading of these special materials.

Thus the tonnage of road stone will be removed from the present secondary plant flow, and will permit even higher production rates of other blends and aggregate fractions. The load on the 636 secondary crusher will also be reduced by this revision, and will permit delivering the intermediate scalper fraction directly to that reduction unit.

As noted earlier, rail shipments are loaded directly onto a spur from the adjoining mainline of the C&NW RR. Truck deliveries are largely transported in the firm's own fleet. This includes eight GMC 450 units with Perfection bodies, four GMC 620 tractors with trailer bodies, and four Ford C-700 cab-over-engine trucks. Loads are weighed out over a Howe platform scale.

It is the firm conviction of Lien management that the use of company-owned and operated trucks for delivery to customers is more beneficial than contract haulage. This opinion stems primarily from a consideration of public relations. It is felt that company drivers are probably more careful and dependable, as well as more conscious of the effect of their operations on the public reaction to their company.

All phases of the Lien operation involve a total crew of 11 men, headed by Bob Groethe, plant superintendent, and his assistant, Lee Snyder. Other key operating personnel include Al Johnson, general superintendent, and Russ Mower, truck and transport superintendent.

In addition to the Rapid City crushed stone facility, the Lien organization also operates two other affiliated production companies—the Oral Sand Company at Oral; and the Birdsall Sand and Gravel Company at Wasta. With the obviously able assistance of his sons and partners, Chuck and Bruce, Pete Lien has recorded one of the most striking growth rates that can be found in the industry—a rate that shows no signs of slackening, in view of the further planned improvements already scheduled.

U. S. Dimension Stone Output Declines Slightly in 1959

The dimension stone industry operated 583 plants in 43 states during 1959, but most of the output was centered in certain districts of Indiana, Pennsylvania, Georgia, Ohio, Massachusetts, Vermont, Tennessee, Wisconsin, New York, and Minnesota.

Production of dimension stone totaled 2.4 million short tons, valued at $87,000,000, a slight decrease from the 1958 tonnage, but an increase of 9 percent in value, as reported by producers to the U. S. Bureau of Mines.

Gypsum Production and Value Reach New Highs in 1959

A new high in the output of crude gypsum was reached in the domestic gypsum industry during 1959, according to producers' reports released to the U. S. Bureau of Mines. Domestic mines produced 10,900,000 short tons—14 percent above the volume mined in 1958.

The production rate was highest during the second and third quarters. Calcined gypsum produced during 1959 totaled 9,300,000 tons—an increase of 14 percent.

The 67 mines operated comprised 50 open-pit, 15 underground, and 2 combined open-pit-underground.

The average value of crude gypsum mined in the United States was $3.59 per ton, compared with $3.38 in 1958 and $3.25 in 1957.

Imports of crude gypsum increased 52 percent—from 4,000,000 short tons in 1958 to 6,100,000 during 1959.

Iron-Blast-Furnace Slag Sales Maintain High Level in 1959

Sales of iron-blast-furnace slag continued in 1959 at virtually the same high level as in 1958, despite a slump in highway construction, a 316-day steel strike that shut-off production in mid-year, and home-financing difficulties.

Output of over 28 million short tons of processed iron-blast-furnace slag was sold for over $47 million—a slight decrease in tonnage but an increase of $2,000,000 in value, compared with 1958. Figures were reported for 37 companies, operating 59 air-cooled, 14 granulated, and 23 expanded slag plants.

Screened air-cooled slag, the major product, increased 6 percent to nearly 22 million short tons, and the value increased 8 percent to $36,800,000. Of this total, 19,400,000 million short tons (or 90 percent) was used as aggregate in portland cement concrete, bituminous concrete of all types, railroad ballast, and miscellaneous highway and airport construction.

Output of unscreened air-cooled slag totaled over one million tons, valued at nearly $1 million.

Production of granulated slag totaled 2,700,000 short tons—a decline of 24 percent.

Expanded slag production totaled 2,800,000 tons, valued at over $8,000,000—down only slightly due to the steel strike.

P.C.A. Receives Two Awards For Film and Publication

The Portland Cement Association, Chicago, has been awarded two blue ribbons by the American Society of Agricultural Engineers for effective informational material prepared and publicized by the P.C.A. staff. The awards were made at the 53rd annual meeting of A.S.A.E. in Columbus, Ohio.

The Pageant of American Farms, a 16-minute, 16-mm. color-sound film produced by P.C.A. in 1959, received the first blue ribbon. The second went to the association's periodical, *Rural Concrete Builder*.

L. E. McDermut, Promoter Of Blast-Furnace Slag Retires from Business

L. E. McDermut, one of the pioneers in the slag processing industry, has announced his retirement as president of the Illinois Slag & Ballast Company, Chicago. He has

L. E. McDermut

held this position for 35 years. He has been succeeded by R. K. Merring, former vice-president of the firm. Wilson McDermut, former general superintendent, has been elected vice-president, succeeding Mr. Merring in that position.

Mr. McDermut has been associated with the slag and ballast industry all his life and has helped to promote new uses for the material in the manufacture of glass and rock wool.

Illinois Slag & Ballast specializes in the processing of high-quality blast-furnace slag from the Wisconsin Steel Division of International Harvester. The slag is dumped from ladle cars on to a cooling bank before it is processed for use in the manufacture of glass and spun mineral wool.

Mr. McDermut has been a longtime member of the board of directors of National Slag Association and was president of the group in 1944.

Vertical Lime Kilns Converted To Bunker C Oil Firing

Dominion Lime Ltd., St. Bruno, Que., has completed the conversion of its vertical kilns at the Lime Ridge plant. The kilns, which formerly burned coal producer gas, are now fired by gasified Bunker C oil. The firm is believed to be the only one in North America firing vertical kilns by this method, and has applied for patents on the process. Officials have indicated they will make the process available to the industry.

The conversion has resulted in a lime with high availability and faster slaking qualities. In addition, T. A. Rourke, vice-president of the firm, reports savings in labor costs and greater ease in operating control.

Officers Elected at Convention Of New York State Association

Officers elected recently at the ninth annual convention of the Empire State, Sand, Gravel, and Ready Mix Association (New York) are as follows: President—Richard M. Burgess, Mohawk Valley Concrete Co., Canajoharie; vice-president—Robert L. Finewood, Valley Sand and Gravel Co., Rochester; secretary—Frank D. Cooney Jr., Cooney Brothers, Tarrytown; treasurer—Henry H. Kerwin, Eastern Rock Products, Inc., Utica.

Three new directors were elected: Donald L. Coe, Empire Builders Supply Co., Niagara Falls; L. R. Whitford, L. C. Whitford Co., Wellsville; and Edward Ryan, Ryan Ready Mix Concrete Corp., Brooklyn. The executive secretary is Paul R. Smith, Buffalo.

Hammer, Anyone?

The hay-fever season may be over, but the Denver *Post* reports a new type of allergy in Colorado. While Norman Burt was working with a paving crew near Dead Man's Corner on Highway 160, he was accidentally bopped on the head with a hammer.

After a doctor had patched him up, he went back on the job. Some one accidentally dropped a hammer into a gravel crusher. The crusher hurled the hammer back out. You know who attracted the hammer! This time one of Norman's elbows was broken. We hope that those hammers are now staying where they belong.

"It was so-o-o long . . ."

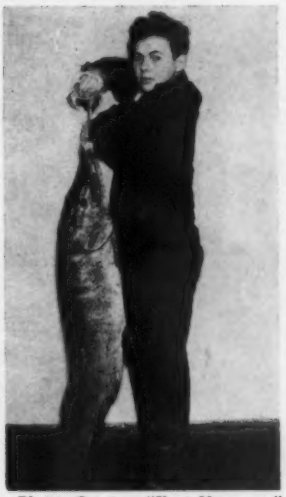


Photo: Courtesy "Kent Messenger"

Peter Lilley and his pike.

Of Pike and Mammoth-Teeth And Fish-Stocked Gravel Pits

We saw it in *Cement, Lime & Gravel,* a British magazine serving the nonmetallic minerals industry in the United Kingdom. We tell you this before you read, so you'll know it's not just our kind of fish story.

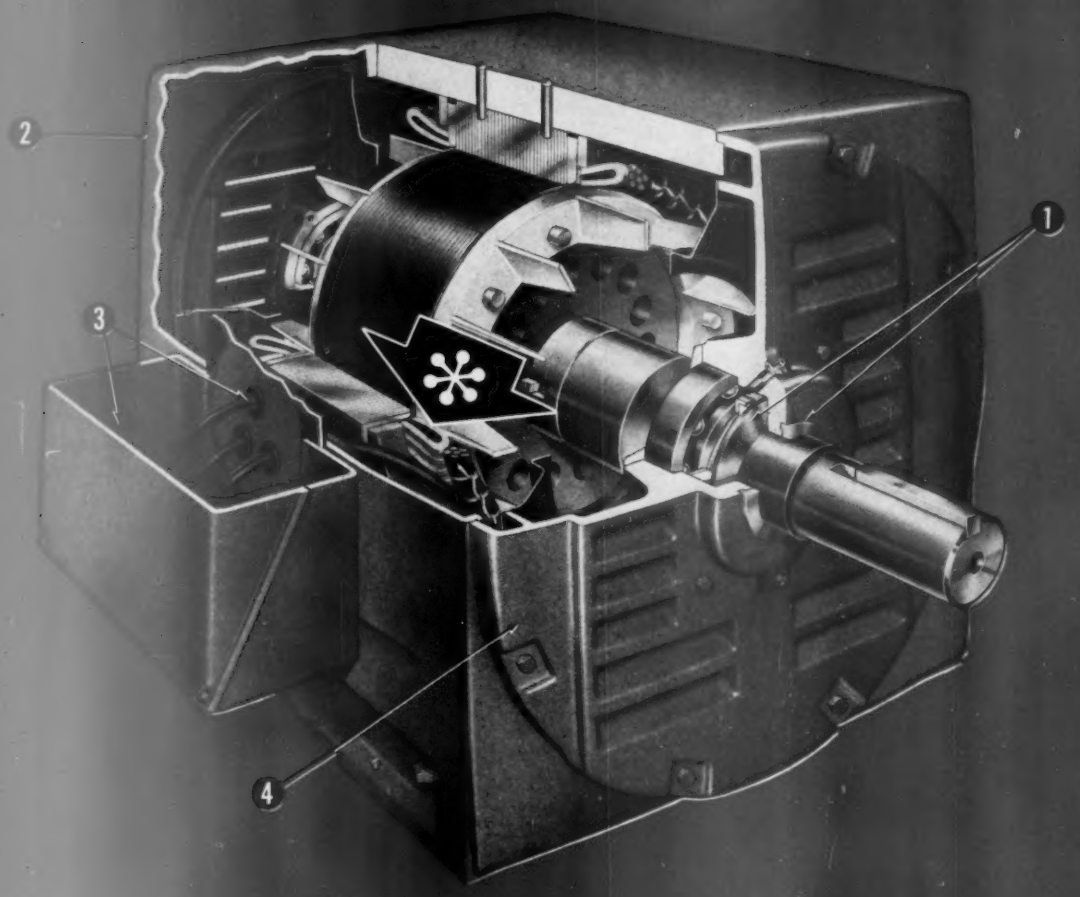
"Early this year, young Peter Lilley, aged 16, of Canterbury, matched his wits against a 20-year old, and won. The 20-year-old was a 44-in. pike, weighing 30¼ lb., and Peter Lilley caught it after a quarter-of-an-hour battle, during which the fish made two long runs and was narrowly prevented from tangling the line.

"Peter Lilley has been awarded a prize of £20 and a strange trophy—even older than the pike. The trophy is a mounted mammoth's tooth, presented by the Sand and Gravel Association of Great Britain for the best specimen fish caught each year amoung clubs fishing in wet gravel pits. The tooth is 7½ in. long, 2¼ in. wide, and 7½ in. deep, and must date back at least 10,000 years, when the last of the shaggy mammoths roamed about England. . . .

"There is only one mammoth tooth trophy, but cash prizes were won by members of the large number of clubs whose home waters are wet pits—in most parts of the country the only form of lake available to the club angler."

General Electric's CUSTOM '8000'* means . . .

MOTORS CUSTOM DESIGNED FOR MINE AND QUARRY APPLICATIONS



1 **WATER RESISTANT BEARING SEALS** guard bearings of 'CUSTOM 8000' motors against damage from moisture and abrasive dusts encountered in mining operations.

2 **RUGGED CAST IRON FRAME** is built to give maximum protection on toughest jobs—frames are factory tested to withstand shocks in the magnitude of 20G.

3 **EXTRA LARGE CAST IRON CONDUIT BOX** has gaskets at the split and between frame and box to seal out dust and moisture. Leads enter box through rubber grommets which seal out ambient air.

4 **NEW, FLAT, CAST IRON END SHIELDS** are designed for durability, yet offer the lightweight, easy removal features which can cut hours and dollars from your maintenance schedules. Angled louvers assure both effective protection and the maximum ventilating efficiency demanded of mine and quarry motors.

IN ADDITION TO THE SPECIAL FEATURES for mine and quarry applications mentioned above, **CUSTOM '8000'** motors offer these superior "standard" features: "positive purging" lubrication system with rotating slinger increases bearing life and prevents grease leakage along the shaft (new sleeve bearing design also available); pre-wound stator core assures uniform high performance; and, dynamically balanced, cast aluminum rotor windings and fan provide maximum reliability.

CUSTOM '8000' MOTORS are manufactured to the rigid quality specifications General Electric has adhered to for over 80 years. Today with the implementation of advanced design and manufacturing techniques, G.E. can accurately and economically *Customize* motors to your specific requirements through utilization of motor components engineered exclusively for mine and quarry applications.

* *Trade-mark of General Electric Co.*

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POLYSEAL* INSULATION SYSTEM LENGTHENS MOTOR LIFE

General Electric's new Polyseal supported silicone rubber insulation system is highly resistant to abrasion by airborne particles usually found in mines and quarries.

The Polyseal system assures superior mechanical, thermal, voltage and environmental endurance. This form-wound insulation is a vulcanized system "built up" from silicone rubber tape reinforced by glass and Dacron† fabric. Polyseal both retains its resilience and provides a positive seal against moisture and other mine and quarry contaminants.

POSITIVE MOISTURE PROTECTION is assured by "under water" production line tests. For example, 2300-volt, form-wound Polyseal coils are water soaked for one-half hour—then "hi-potted" at 8000-volts while still completely immersed—to prove the insulation system is absolutely sealed.

† *Registered Trade-mark DuPont Co.*

CALL YOUR GENERAL ELECTRIC APPARATUS SALES OFFICE

for full information on CUSTOM '8000' motors for mines and quarries, or write for Bulletins GEA-6865 and GEA-6889, to Section 884-12, General Electric Company, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Enter 94 on card, page 197

Wire Rope Bridge

(*Concluded from page* 85.)

project, and it was pre-selected by the builder, the Army Corps of Engineers. In order to get these aggregates over to the batch plant on the north bank, Atkinson engineers considered two alternatives: (1) erecting a 1,000-ft. long vehicular bridge or (2) spanning the river with a suspended belt-conveyor.

After the economic considerations and other factors had been carefully weighed, a wire-rope suspension bridge conveyor was chosen, largely because of its high salvage value. The span, designed by Roebling, is now carrying the aggregates across the river on a 30-in. by 930-ft. on-centers belt at the maximum clip of 1,000 t.p.h.

Bottom-dump tractor-trailers carrying 30-ton loads of the various aggregates discharge to a receiving hopper on the south bank of the Snake River. A short inclined belt conveyor (No. 1) transfers the sand and gravel to a horizontal, reversible belt conveyor (No. 2) running above the open tops of a row of five surge storage silos, each of 1,000-ton capacity. Five sizes of aggregates are used, ranging from sand to 3- by 6-in. cobbles. Each size is separately stored in the silos.

Conveyor No. 3 reclaims from the bottom of these five silos and carries the aggregates across the river, transferring on the north bank to Conveyor No. 4, which delivers to a rinsing-screen structure. The rinsed aggregates are then finally transported by Conveyor No. 5 to the central concrete mixing plant.

Instead of conventional stiffening trusses, 1¾-in. wind cables were employed to minimize sway in the suspension bridge supporting the 930-ft. conveyor. The suspension bridge is working out perfectly. Belt travel speed is 300 f.p.m. A total of 1,278,600 tons of aggregates will thus be carried across the river for the Atkinson job.

The automatic batching and mixing plant is required to turn out 11 different concrete mixes for the various phases of the project. Capacity of the plant is 1,500 cu. yd. in 8 hr. About 370,000 bbl. of cement and 22,000 tons of pozzolan will be required. Concrete yardage will total 695,000.

HELP SCIENCE FIGHT TB

ANSWER YOUR CHRISTMAS SEAL LETTER TODAY

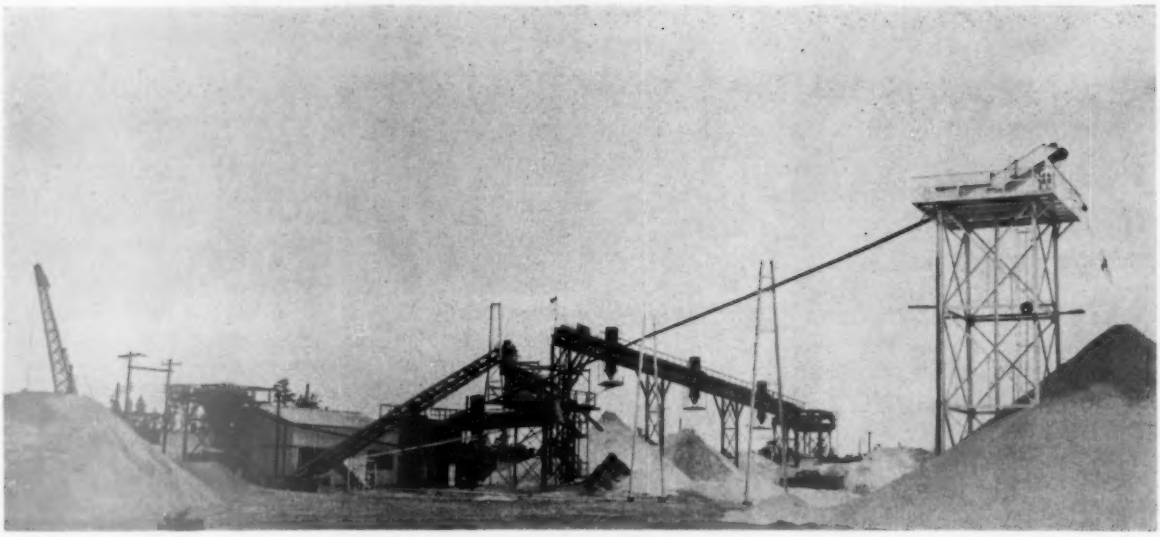
1959 Perlite Sold or Used Increases by 11 Percent

The quantity of cleaned and sized crude perlite sold or used by producers in 1959 was 325,000 short tons—an increase of 11 percent over 1958—according to reports of producers made to the U. S. Bureau of Mines.

Crude perlite totaling 104,000 tons was used by miners in their own expanding plants—an increase of 9 percent over 1958. Crude sold to expanders who were not prime producers totaled 221,000 tons—12 percent more than in 1958.

New Mexico again was the leading perlite producing state, turned out 241,000 tons, or 54 percent of the total domestic output. One of the largest New Mexico producers of crude, the F. E. Schundler Company, was sold to the Johns-Manville Company during 1959.

Expanded perlite production was 276,000 tons—15 percent more than in 1958.



Whitehead's South Carolina Plant

Opens New Foundry Sand Market In Southeastern States

ANOTHER ON THE SPOT report

THE WHITEHEAD Brothers Company of New York City, long one of the leading producers of foundry and industrial sands, with plants in New Jersey, New York, and New England, recently moved into the Southeast with a modern new operation near Lugoff, S. C. This 50-t.p.h. plant is located at a deposit between Lugoff and Blaney, 15 miles northeast of Columbia, S. C. This deposit was found after a long search for sand similar to that found in New Jersey from which similar products can be made. Most of the output is foundry sand, and shipments are made throughout the southeastern states, from Virginia to Alabama and Florida.

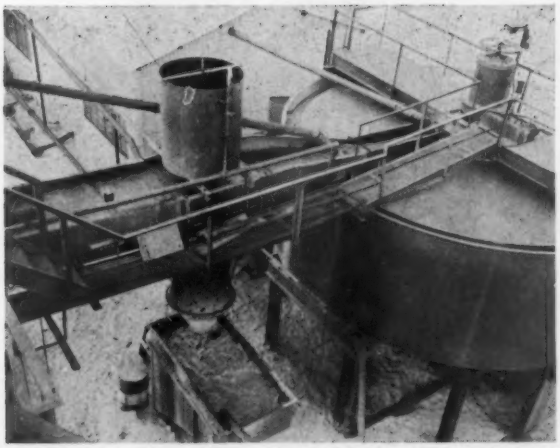
The plant is of more or less standard design and uses the latest methods and equipment. A washing and classifying department makes five standard sizes and any desired specials. The five standards are stockpiled for feed to the drying department, to which they can be fed in straight sizes or in any desired blends between No. 35 and No. 140 A.F.S. foundry sands. Various specials, including industrial sands, can also be made. This plant was designed by the company's staff.

The deposit on the 1,600-acre property ranges up to 90 ft. in depth, with a light clay overburden only in spots; but it has some brush and trees. The sand is fairly white, even before processing. It averages 42 to 50 A.F.S. and 100 percent

One of the two 2-cu. yd. front-end loaders used in the pit for loading trucks and removing overburden.

This general view of the washing and classifying department shows (left) the rough classifying equipment and grinding building; the main classifying flume (center); and the separate classifying tower (right).

By WALTER E. TRAUFFER



The flume from the scalping screen, with the classifier which scalps out coarse to the sump. From the latter it is pumped to the grinding mill in the building in the background. The 25-ft. diameter hydroseparator at the right removes extreme fines.

through 12-mesh and is well graded, with sub-angular grains. A typical chemical analysis of this sand after treatment follows:

SiO_2 — 99.40 percent
Fe_2O_3 — 0.01 percent
Al_2O_3 — 0.28 percent
TiO_2 — 0.019 percent
Cr_2O_3 — 0 percent
CaO — 0.01 percent
MgO — Trace
Loss on Ign. —0.20 percent

The 10-ft. average bank is dug by two 2-cu. yd. Michigan front-end loaders which also remove overburden as needed. Three Ford F600 end-dump trucks haul a few hundred feet to the plant. There they dump to a feed hopper or, if this is full, to a stockpile with a capacity for about three days' operation of the plant. Rehandling to and from this pile is done by a Northwest crane with a ¾-cu. yd. clamshell bucket.

A Syntron vibrating feeder discharges the sand from the hopper to an 18-in. by 116-ft. belt conveyor. The latter discharges to a head box, where water is added to the sand before it flows onto the 4- by 8-ft. Link-Belt CA 248 two-deck screen. Only one deck is being used now, with 8-mesh stainless steel cloth having .041-in. wires. This screen has Link-Belt sprays. The oversize, consisting mainly of roots, is flumed to waste.

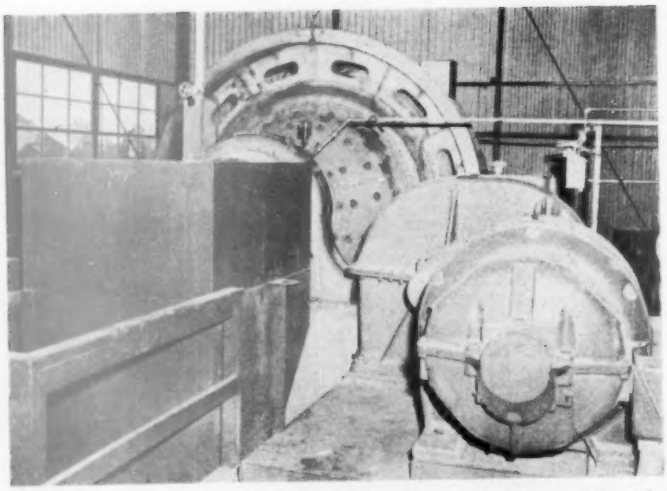
The sand passing through the screen is flumed to a 36-in. diameter Link-Belt Shaw classifier used for scalping out coarse. The coarse sand goes to a sump, from which a 4-in. Allen-Sherman-Hoff rubber-lined pump discharges to the feed cone of the 9-ft. diameter by 48-in. Hardinge conical mill. This is loaded with 15 to 20 tons of 1½-in. Grinding Balls, Inc., Ni-Hard steel balls.

The amperage drawn by the mill motor is the guide for adding balls to compensate for grinding loss. This mill is driven at 18 r.p.m. by a 250-hp. Allis-Chalmers induction motor through a Falk reducer. The scouring action of the mill completely cleans the product and removes any surface stain on the grains. The product goes to a sump, from which a 4-in. A.S.H. pump feeds it to a hydroseparator.

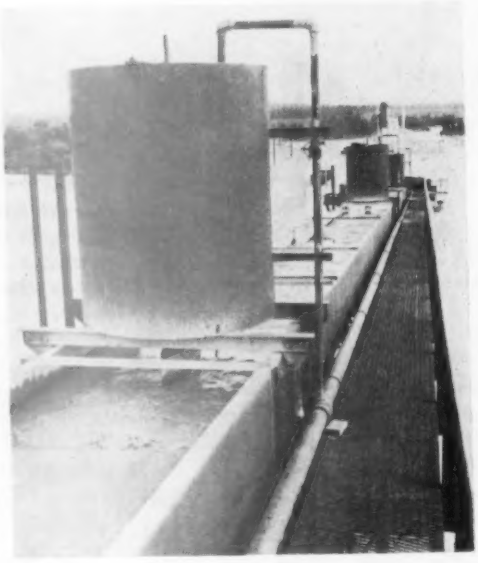
The fine-mesh material overflowing the scalping classifier goes *via* the flume to the hydroseparator.

In this flume there is a 4-in. opening to a pipe with a Flex-Valve rubber clamp valve. Discharge is into a sump from which another 4-in. A.S.H. pump feeds through a 4-in. line to a separate classifying tower. There it discharges to a 20-in. by 14-ft. Link-Belt double-screw washer operating at 30 r.p.m. The

The wet plant, showing the screen, the classifier, the hydroseparator, and the mill building. A part of the main classifying flume can be seen at the left.



The 9-ft. by 48-in. conical mill, with its 250-hp. motor and reducer, at the right.



Left: The main classifying flume, with three classifiers (producing A.F.S. No. 52, 72, and 100 sands) which discharge to the stockpiles below.

Below: This revolving rake classifier at the end of the flume discharges A.F.S. No. 140 sand to the stockpile.

dewatered material drops to a pile as A.F.S. No. 35B sand (minus 12-mesh).

Water and fines overflowing the screw washer return through a pipe to the 25-ft. diameter by 8-ft. deep Hardinge hydroseparator, which also receives the fines from the scalping classifier and the mill product. Fines overflowing the hydroseparator are flumed to settling ponds.

The minus 12-mesh product of the hydroseparator goes to another 4-in. A.S.H. pump which feeds it to the main sand classifying flume which is 2 ft. deep, 4 ft. 3 in. wide, and 180 ft. long. Spaced 60 ft. apart on this flume are three 36-in. diameter Link-Belt Shaw classifiers which make, respectively, No. 52, No. 72, and No. 100 A.F.S. sand. These products drop to stockpiles. A dam ahead of each classifier slows the flow.

The flow past these classifiers goes to a 15-ft. Link-Belt Rotoscoop at the end of the flume, which makes A.F.S. No. 140 plus sand that also drops to a stockpile. The overflow from the Rotoscoop also goes to the settling pond.

The sand from the three Shaw classifiers can, if desired, be fed back by gravity to the sump under the scalping classifier and to the mill for finer grinding.

The settling bed mentioned above receives overflow water and fines from the hydroseparator and Rotoscoop. It overflows into a 25-acre pond fed by two small streams. This pond, in turn, overflows back into the streams. (It is the source of water for the plant.) A 2,000-g.p.m. Goulds pump feeds water to a surge tank supplying the wash plant. 1,200-g.p.m. Goulds pumps supply the water used on the screen, the screw washer, and elsewhere.

Stockpiled sand is moved out from the five piles by Michigan front-end loaders to aerate and drain; it is also loaded by them into trucks for the short haul to the sand drying plant. At this point the five basic sizes can be blended to any desired specification.

The sand is discharged *via* a hopper and a Syntron electric vibrating feeder to an 18-in. by 56-ft. belt conveyor, which discharges to the 12-in. screw feeder of a 9- by 32-ft. Link-Belt Roto-Louvre drier. The latter has a Hauck gas or oil burner

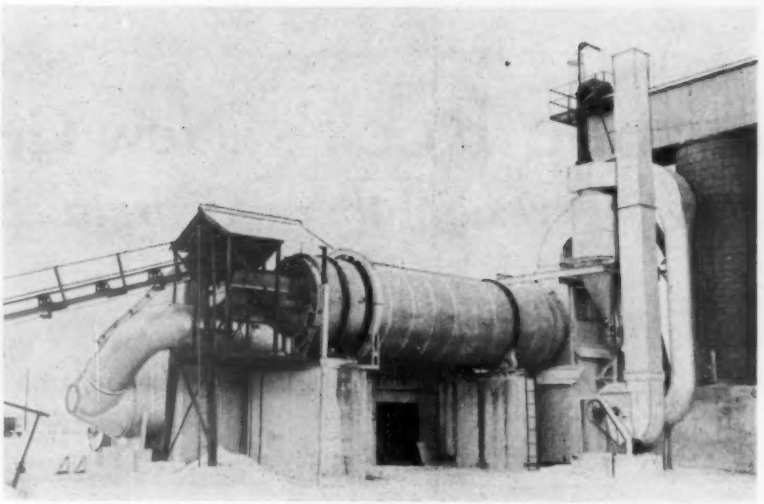
which can be used for either fuel; it is now burning natural pipeline gas. A 42-in. diameter metal duct curving 180 deg. carries heat from the furnace without flame. The furnace and duct are lined, but the drier is not.

A Minneapolis-Honeywell control system is used to hold inlet air temperature to 800-900 deg. F., exhaust air at 350 deg., and static pressure at the discharge end at ½ to ¾ in. There are separate Brown-Honeywell recorders for the two temperatures and for the pressure.

Hot air from the drier is drawn through a pair of 5½-ft. diameter Link-Belt cyclone collectors by a 15,200 c.f.m. draft fan, which is followed by a steel stack. The collected fines can run in with the drier discharge when fine sands are being processed; when coarse sands are being made, it goes to a pile.

The drier product is discharged to a 3- by 8-ft. Link-Belt UP138 single-deck screen. Wire screen cloth of various mesh sizes is used, depending on the product being made. The screen oversize, mostly foreign matter, is wasted.

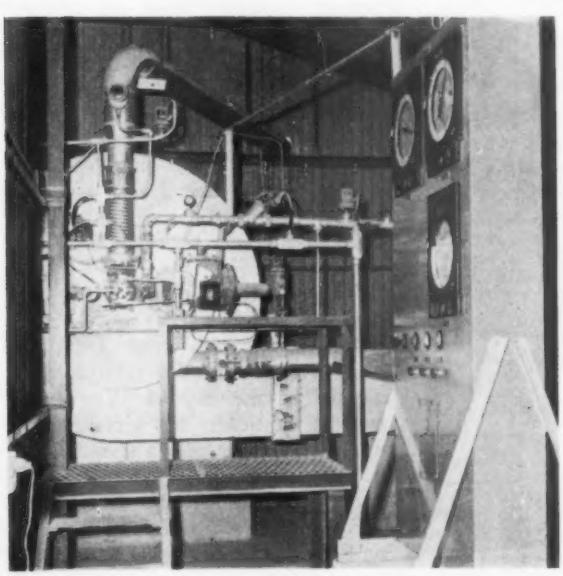
The screen throughs are finished products and are discharged by a bucket elevator to a shuttle belt conveyor over a row of four 100-ton Marietta concrete stave silos. This conveyor can discharge the products into the silos, and it can direct them to cars or trucks through telescopic chutes or to a conveyor under the silos. The latter conveyor feeds to another elevator to a hopper; from this hopper trucks or cars can be loaded, or it can feed to the bagging building.



This view of the drying department shows the silo storage (right) and the rotary drier. The latter can be used with gas or oil. It has a 180-degree reverse duct which carries heat from the furnace without flame.

Bagging is done by a Kraft Bag Corp. automatic weighing packer, and the multiwall bags are sewed by a Union Special sewing machine. Most products are sold in 100-lb. bags, but bags of other sizes are used for some specials. There is ample warehouse space for the many products made at this plant. Other company-made materials and products for the foundry trade are also stocked, including binders, bentonites, pitches, flours, etc.

Officers of Whitehead Brothers Co. are: James H. Whitehead, chairman, president, and general manager; C. B. Somers, executive vice-president in charge of sales; C. G. Bernstrom, vice-president in charge of production; C. Charles McKay, treasurer; and R. J. Maddison, secretary. L. Tomlin is superintendent of the Lugoff plant.



A close-up of the drier furnace, with its burner and auxiliaries. At the right is the control board which governs inlet and exhaust air temperatures and static pressure at the discharge end.

3 Wesco Directors Named—Amis Becomes President

Officers and directors elected recently in the aggregate and concrete companies comprising the West Texas Division of Wesco Materials Corporation and subsidiaries include the following:

Thomas L. Amis, C. W. Murchison Jr., and Wesley W. Pickens, named directors for Permian Sand and Gravel Company, F. M. Reeves & Sons, Inc., and West Concrete Products, Inc., all of Odessa, Tex.; Pannell Bros., Inc., and Midland Concrete Company, both of Midland, Tex.; Montgomery Sand and Gravel, Inc., of San Angelo; and Stacy, Inc., of Roswell, N. M.

Mr. Amis was elected president of all the companies.

Tyrone Rock's *New Georgia Plant*
Serves Southern Georgia, Northern Florida

By WALTER E. TRAUFFER

Six sizes stored and blended to meet any specifications

ANOTHER ON THE SPOT report

FOR various reasons, the crushed stone industry in Georgia has probably led the nation in plant capacity added in recent years. This has included the construction of several outstanding new plants, including that of the Tyrone Rock Products Company near Yatesville, Ga. This modern new 350-t.p.h. operation is the result of the company's intensive effort to find a suitable deposit of Class A granite as far south of Atlanta as possible in order to ship into southern Georgia and northern Florida, where there are no extensive hard aggregate deposits. This location, 30 miles west of Macon, supplements the company's other two plants at Tyrone and Forest Park in the Atlanta area.

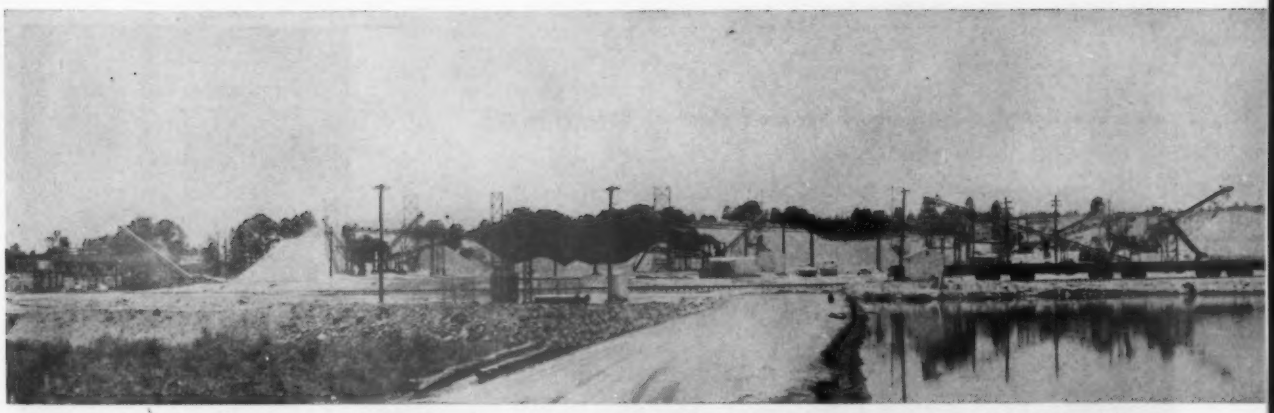
When this deposit was located, it was thoroughly core-drilled and tested and was found to be large enough, deep enough, and of excellent quality. A plant was then designed to fit the material and the potential market needs, with a capacity of from 250 to 350 t.p.h., depending on the products being made. It was designed by John Hale, general superintendent for Tyrone, with the co-operation of the Iowa Manufacturing Company, which supplied much of the plant equipment, including the 17 belt conveyors. Construction was started in June, 1959, and the plant was in operation in September of that year.

The apron feeder and stationary grizzly ahead of the 42- by 48-in. primary jaw crusher. At the upper right is the control room for this section of the plant.

This plant was designed to make mainly highway sizes, and it usually makes 6 sizes at one time, although 8 can be made. These sizes can be blended to meet any desired specification. As most shipments are by rail, large stockpiles are provided with ample materials available by means of a tunnel belt conveyor. Since all state rock must be washed before shipping, there are ample provisions for doing this.

The deposit is a massive formation of medium-to-fine-grained garnetiferous granite gneiss, composed chiefly of quartz, feldspar, and garnet grains. It has a bulk specific gravity of 2.75 and a Los Angeles Rattler test of 42, well under the state requirement of 45 for Class A stone.

The overburden (up to 8 ft. deep) is removed by shovel and trucks, along with 2 to 3 ft. of weathered and broken rock at the surface of the deposit. The first level of the quarry has a maximum 45-ft. face; eventually a second 30-ft. level will be developed. Chicago Pneumatic and Joy 450 drills with carbide insert bits drill 3½-in. holes on 8- by 10-ft. spacing. These drills



This general view of Tyrone's new plant near Yatesville, Ga., shows the ample amount of storage area available. At the far right is the raw surge stockpile, with its boom and reclaiming conveyor. The primary and secondary crusher stations are in the background. In the right foreground is the tertiary crushing station, followed (left) by the No. 1, 2, and 3 screening stations. The rinsing and loading station at the extreme left is fed from the stockpiles over the 400-ft. long tunnel.

average 30 to 35 ft. of hole per hour and the bits average about 500 ft. of hole after 10 resharpenings. Air is supplied by two Joy 600 portable rotary compressors.

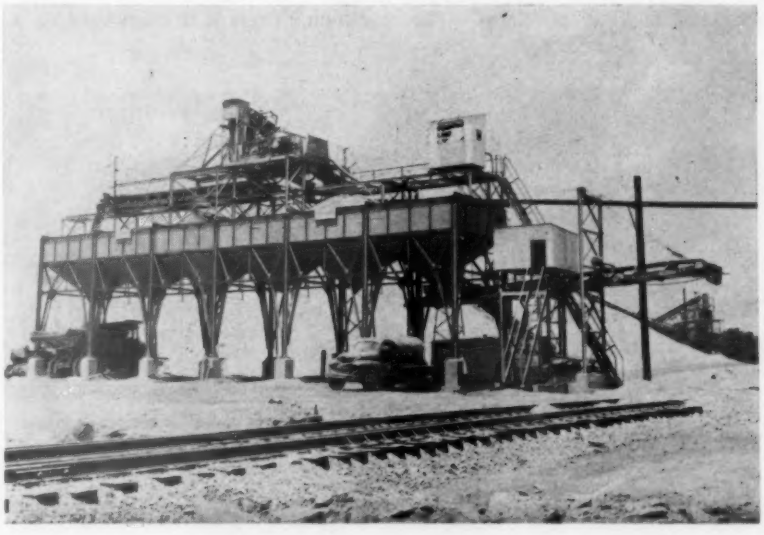
Hercules Gelamite B is used in the bottom of the hole, followed by Hercol No. 2 sticks—60 and 40 percent—and 6 ft. of stemming. Caps are placed in the bottom of the hole, followed by reinforced Primacord to the top. Staggered delays are used, with No. 1 and 2 in the first row of holes, 2 and 3 in the second row, etc. Shots consist of three rows, with a total of 60 to 75 holes. The powder factor averages 2 to 1 in this very solid deposit, which has few seams or cracks. Secondary drilling is being done with Thor jackhammers, supplied by a Sullivan portable compressor. Blasting caps are used in shooting. This method is eventually to be replaced by dropballs.

In the quarry a 2½- cu. yd. Bucyrus-Erie No. 54 diesel shovel loads to International Payhauler diesel trucks with 18-ton end-dump bodies. Two of these units are used for the present maximum 800-ft. haul to the primary crusher. A Caterpillar D7 bulldozer is used for cleanup at the face.

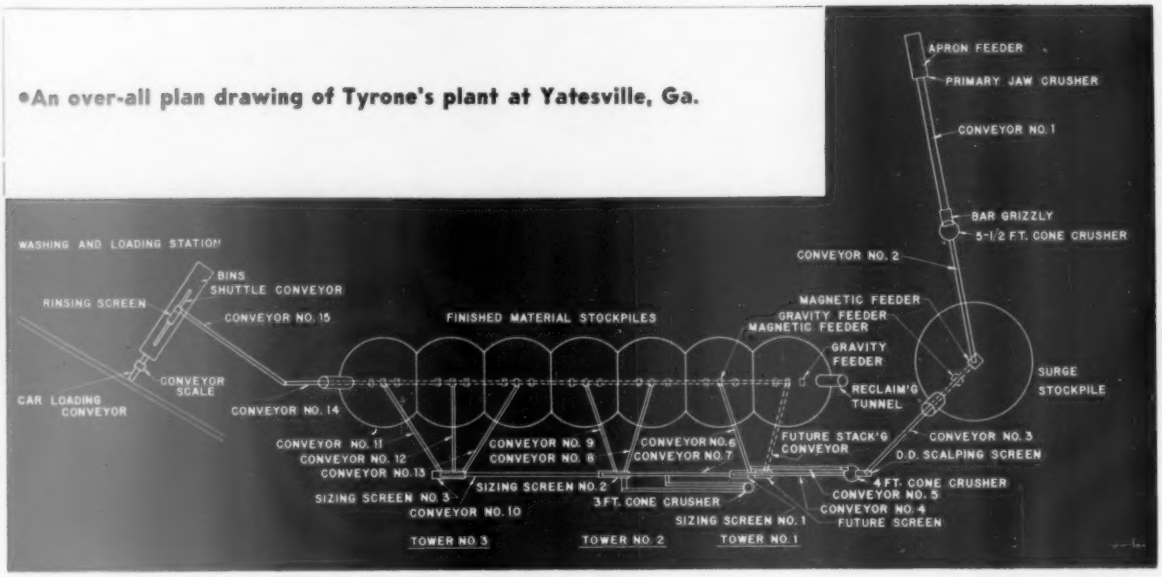
The trucks dump on a 50-in. by 18-ft. 6-in. Cedarapids apron feeder which has a hopper giving it about a 40-ton capacity. The stone is discharged at a controlled rate over a 36-in. wide sloping stationary grizzly with manganese steel bars spaced 3 in. apart. The throughs drop *via* a chute on the belt conveyor. The plus 3-in. material over the grizzly goes to the 42- by 48-in. Cedarapids primary jaw crusher. This is driven by a 200-hp. Westinghouse drip-proof induction motor through V-belts and a Dodge torque coupling which absorbs much of the crushing shock. Water spray nozzles at the primary crusher and at the other crushers wets the material to hold down dust. No other water is used up to the rinsing and loading station.

The minus 6-in. crusher product drops on the minus 3-in. material on 42-in. by 145-ft. belt conveyor No. 1 to the secondary crushing station. There the stone is discharged on a 42-in. by 5-ft. Nordberg Symons vibrating bar grizzly with 1½-in. spacing. The oversize goes to the 5½-ft. Symons standard cone crusher, which is V-belt driven by a 200-hp. Allis-Chalmers motor. The minus 1½-in. grizzly throughs and the minus 3-in. crusher product are carried on 36-in. by 126-ft. con-

Under the washing and loading building are five truck-loading bins and one (right) for loading cars via a boom conveyor. The weighing device in the building at the right loads predetermined weights of material into a car. The room at the top right houses controls for automatic blending from six stockpiles to the rinsing screen and shuttle conveyor over the bins.



•An over-all plan drawing of Tyrone's plant at Yatesville, Ga.



veyor No. 2 to the raw surge pile. This has a capacity of 4,200 tons of which about 1,200 tons is live storage reclaimable through two openings in the tunnel under it. Bulldozers are used to build up any desired extra reserve at this point.

All operations up to the surge pile are controlled from a station at the primary crusher. Operations from this point to the finished material stockpiles are controlled from another station at the tertiary crusher.

One of the two tunnel openings has a 36- by 60-in. Syntron F55-DT electric vibrating feeder to provide any desired rate of feed and the other has a manually operated gate to insure feed at all times. The concrete tunnel is 8 ft. in diameter and has corrugated metal ends. Reclaiming conveyor No. 3 is 30 in. by 137 ft. and inclines outside the tunnel to the tertiary crushing station. There the minus 3-in. rock is discharged on a 4- by 10-ft. Telsmith doubledeck scalping screen. Only one deck is used, with 1¾-in. wire cloth. The oversize is discharged into the 4-ft. Symons short head cone tertiary crusher. This is set to a maximum opening of ½ to ¾ in. as demand requires, but it is usually at ½ in.

This rock, with the minus 1½-in. rock through the scalping screen, is carried on 30-in. by 113-ft. conveyor No. 4 to the No. 1 screening station. There it is discharged on a 5- by 14-ft. Cedarapids 2-deck horizontal vibrating screen which is usually equipped with 1¾- and 1¼-in. wire cloth. The plus 1½-in. rock over the top deck is returned by 24-in. by 86-ft. belt conveyor No. 5 to the tertiary crushing station, where it discharges through a chute into the crusher, forming a closed circuit.

The 1½- to 1-in. rock over the second deck of the No. 1 sizing screen is discharged *via* an 18-in. by 85-ft. stacker belt conveyor (No. 6) to a 2,500-ton stockpile, the first of six piles over a 450-ft. long reclaiming tunnel.

Minus 1-in. material through the bottom deck of screen No. 1 is carried on a 30-in. by 128-ft. horizontal belt conveyor (No. 7) to screening tower No. 2. There it is discharged on another 5- by 14-ft. Cedarapids 2-deck horizontal vibrating screen with ⅞-in. wire cloth on the top deck and ⅝- and ½-in. on the bottom deck. The 1-in. rock (No. 5) over the top deck is stockpiled by an 18-in. by 90-ft. conveyor (No. 8), and the ¾- to ⅜-in. rock (No. 6) over the second deck is stockpiled by an 18-in. by 87-ft. conveyor (No. 9).

The 2½-cu. yd. diesel shovel, loading to one of the two 18-ton end-dump diesel trucks for the 800-ft. haul from the quarry to the plant.

At screening tower No. 1, a 3-ft. Symons short head cone crusher has been installed so that No. 5 or No. 6 stone, or both, conveyed back from sizing screen No. 2, may be further reduced, and then rescreened in closed circuit.

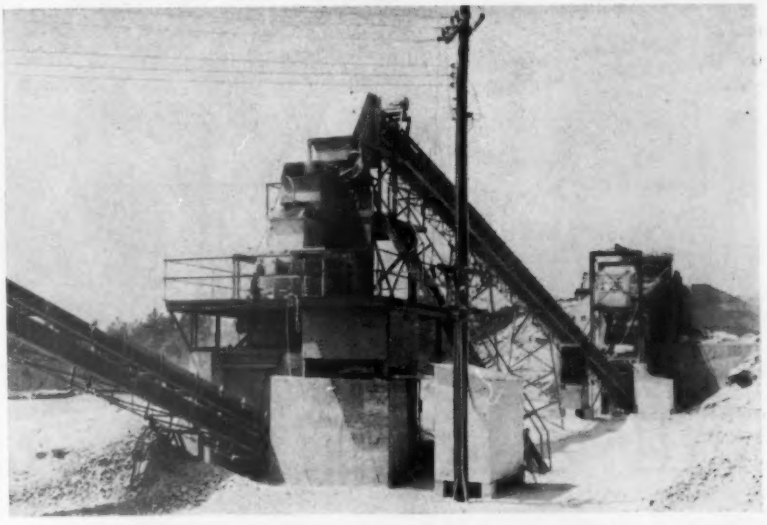
Minus ½-in. material through the bottom deck of sizing screen No. 2 is carried on a 24-in. by 157-ft. inclined conveyor (No. 10) to the No. 3 screening tower. There it is discharged on a third 5- by 14-ft. Cedarapids 2-deck horizontal screen, this one with ⅜-in. and 4-mesh openings. All three products—No. 7, ½- to ⅜-in.; No. 8, ⅜-in. to 4-mesh; and minus 4-mesh screenings—are carried to stockpiles on 18-in. stacking conveyors (No. 11, 12, and 13), respectively 101, 85, and 101 ft. long.

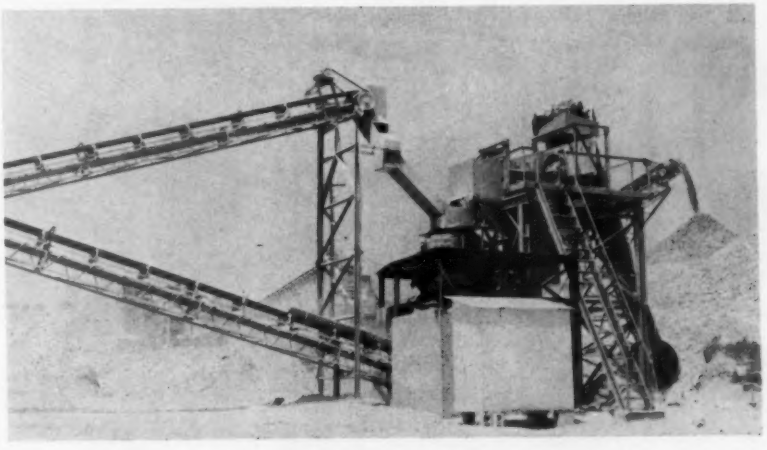
Each of the six storage piles has a capacity of 2,500 tons, of which about 600 tons is live capacity reclaimable by gravity through three openings under each pile. These piles are built up to any desired capacity by bulldozers. At each reclaiming point, the center opening has a 30- by 48-in. Syntron F45DT electric vibrating feeder; the other two have manually operated gates which are ordinarily used only in emergencies. Pushbuttons in the control house at the top of the washing and loading building operate these feeders, and rheostats can control each at 0 to 100 percent of capacity. Predetermined settings make any desired blend possible, some—like No. 467 base material—using three different sizes. An interlock stops all feeders in case of trouble. The 450-ft. long reclaiming tunnel under these piles is built of 8-ft. diameter, 8-gauge Armco corrugated metal sections designed for this purpose. The tunnel has a 1 percent slope toward the discharge end for drainage.

The 30-in. by 444-ft. tunnel belt conveyor (No. 14) is slightly inclined at its end to discharge on a 30-in. by 123-ft. conveyor (No. 15) to the top of the washing and load-

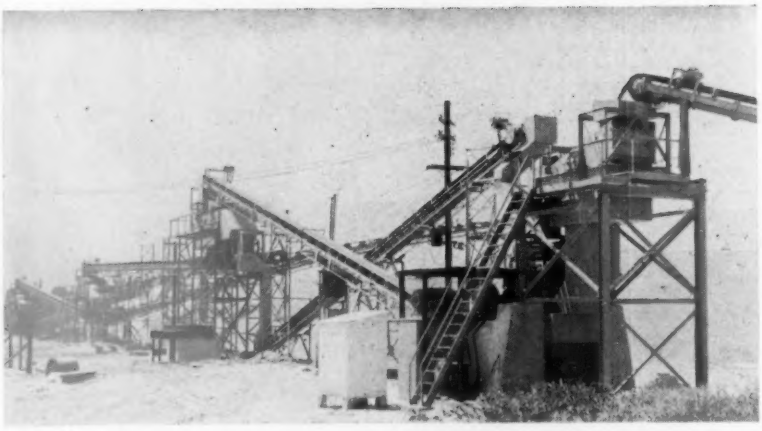
Evidence of the rugged handling job that is done is seen in this view of the hopper of the apron feeder to the primary crusher.

The secondary crushing station, with the vibrating bar grizzly over the 5½-ft. cone crusher. The primary crusher is in the background. The conveyor at the left feeds to the surge stockpile.



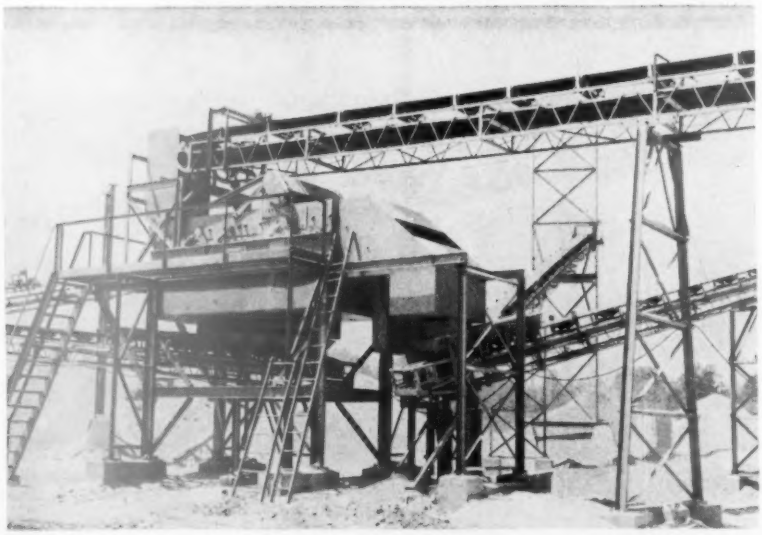


In this view the tertiary crushing station is shown, with the scalping screen and the 4-ft. cone crusher. The reclaiming conveyor from the surge stockpile is at the right. The control building for the screening department is in the foreground.



Another view, showing the tertiary crushing station, with the three screening stations in the left background.

The first screening station, with the boom conveyor to the stockpile in the background. At the right a part of the footing for the 3-ft. cone reduction crusher is visible. This unit now has been installed.



The screening station (No. 2), with the stockpiling conveyors in the background. The conveyor to the new crusher at station No. 1 had not yet been installed.

ing building. There it can discharge on a 5- by 12-ft. Cedarapids 2-deck horizontal rinsing screen, which has ¾-in. and 4-mesh wire cloth and three sprays on both decks. The rinsed material over both decks of the screen drops on a 36-in. by 40-ft. reversible shuttle belt conveyor which discharges into any of the six 50-cu. yd. capacity Cedarapids steel bins. Dry material from the stockpiles can by-pass the screen direct to this shuttle conveyor.

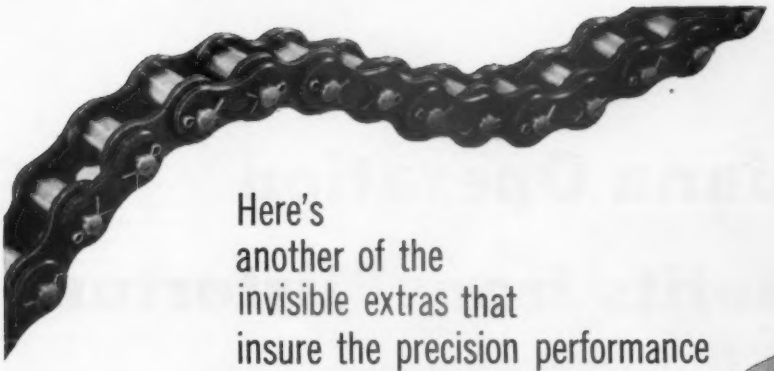
Five of the above bins are used for loading trucks through sliding gates. The sixth bin discharges into cars *via* a 36-in. by 40-ft. boom conveyor which can be raised to permit the passage of locomotives. The loading of cars is a continuous procedure from stockpiles on, with a capacity of 500 t.p.h. This bin serves as a surge when cars are being moved, so that the system need not be shut down.

A Merrick Weightometer on the car-loading conveyor loads any predetermined weight of stone into cars and keeps a continuous total of output. These records are accepted by both the railroad and the state. On wet material a different agreed percentage is allowed for water in each size of material. There is gravity storage for 40 cars on two tracks, both above and below the plant, and the line is open to the Southern Railway, 3 miles away.

Comparatively little loading of materials is done direct from storage piles. Such material consists mainly of screenings for local use, and loading is done with a 3-cu. yd. Michigan 175 front-end loader which is also used for extending stockpiles and general service about the property. All truck shipments are weighed on a 50-ton Winslow scale with a 40-ft. platform.

Water for washing and other purposes is taken from a stream by a

(*Concluded on page* 110.)



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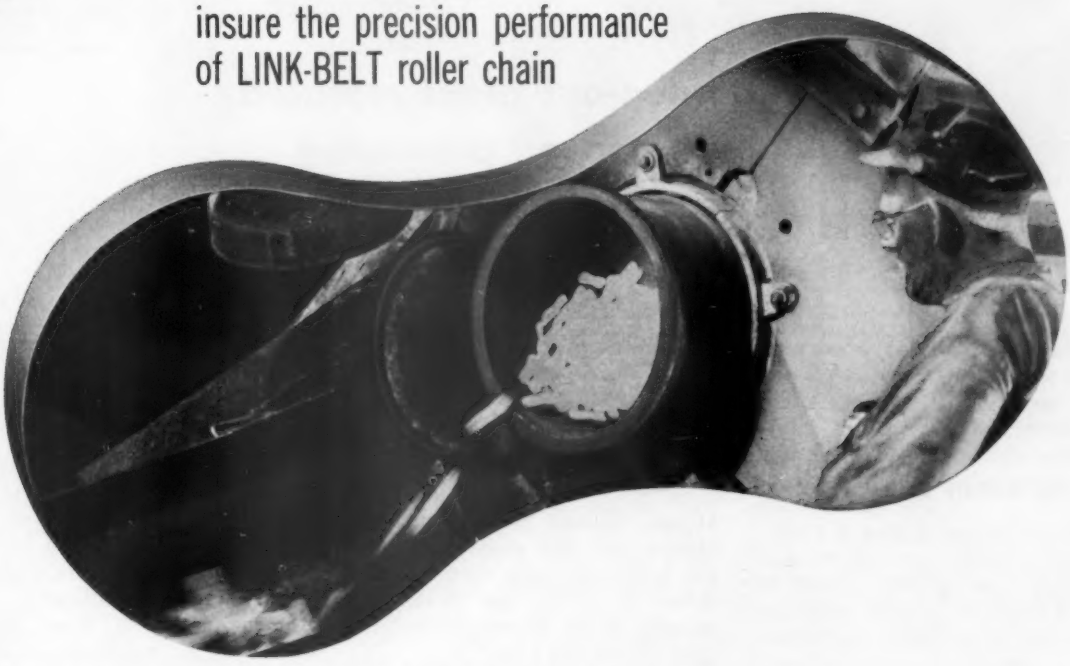
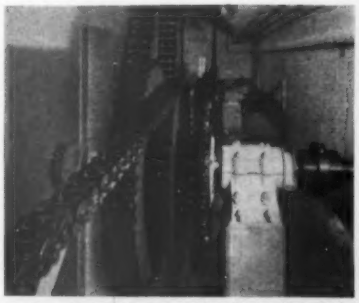


Painstaking precision of heat-treat control gives you

uniform strength in every link

To produce roller chain of utmost uniformity, Link-Belt maintains exacting control of all heat-treating processes. With equipment and instrumentation exactly tailored to the need, all processes are carefully adjusted to suit the characteristics of each heat and analysis of steel. Result: roller chain of uniform strength *well above accepted standards*. Chain that absorbs shock loads, delivers full power under continuous heavy going.

Precise heat-treat control is one of many *invisible extras* that contribute to the greater strength and endurance of Link-Belt roller chain. Others include prestressing, pitch-hole preparation, shot-peening. These features—plus painstaking precision and inspection in every step of manufacture—assure you of chain that can easily cope with today's heavy loads and high speeds.



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ROLLER CHAINS AND SPROCKETS

Indiana Operation Benefits from Misfortune

Burned-out plant replaced by improved processing, greater efficiency

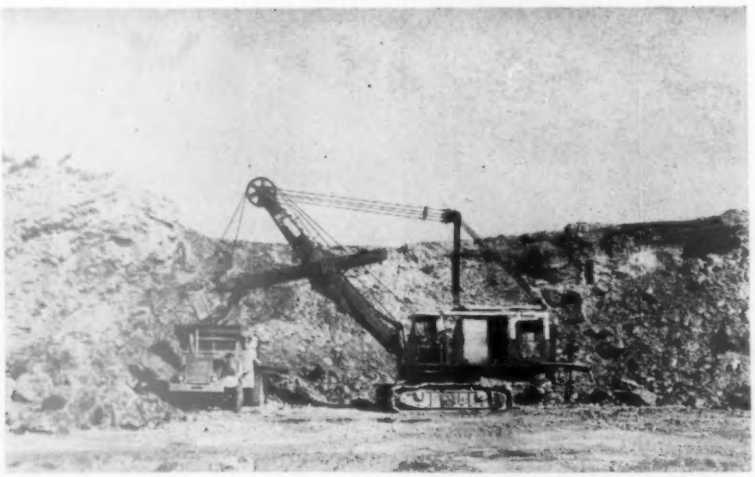
By BUREN C. HEROD

DURING more than ten years from the time an old, obsolescent quarrying operation was acquired in 1946, the management of Monon Crushed Stone Company, Monon, Ind., had expended countless hours and many thousands of dollars in raising the productive capacity of the 50-year-old facility from 125 to 350 t.p.h.

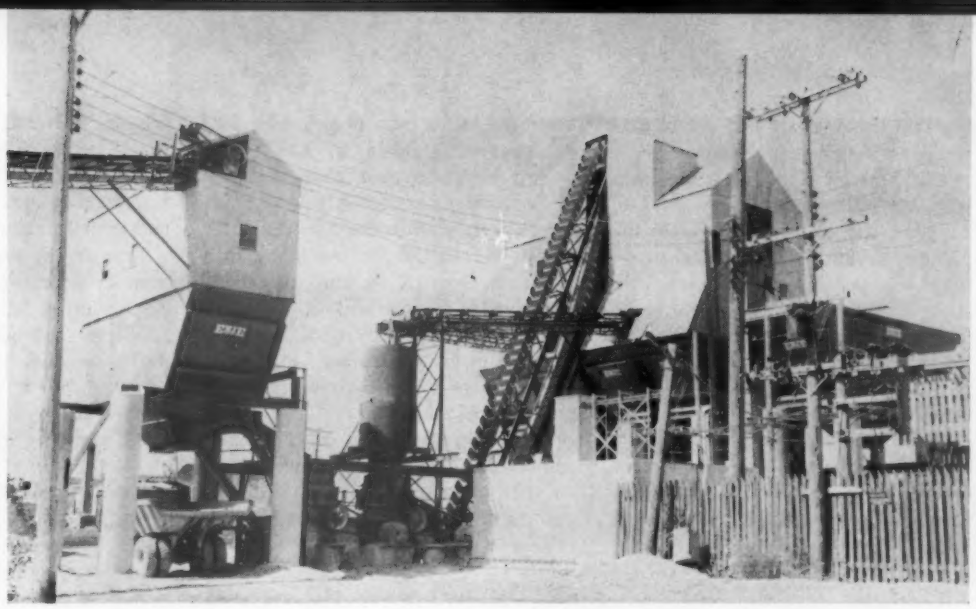
And then, literally, lightning struck. In the resultant fire, two summers ago, the plant was completely burned out—and the results of their hard work were dissipated with the smoke from the debris. However, as shown by subsequent developments, the apparently disastrous blow to the company's growth was made to pay off.

At acquisition, the old plant incorporated steam power, and all processing in both primary and secondary phases was located on one site. Improvements were soon initiated through electrification, and also installation of diesel power units, plus the installation of additional processing equipment, to complement the older low-capacity units. By these programs the capacity had been more than doubled, as noted above, and before the fire, the production flow involved nine screens and four crushers.

Almost immediately after the fire, management began to lay plans for a new operation. To a considerable extent, starting from scratch had certain advantages. For one thing, the design—worked out by company officials — comprehended the current practice of separating the primary and secondary phases. The former was installed at a lower level in the quarry area, and the



This view of quarry operations shows the extensive fracturing of the formation which, along with blasting, contributes to the nominal amount of secondary breakage required.



The new, highly compact secondary phase of the Monon operation occupies the site of the entire old plant. The capacity of the new operation is the same as that of the first plant. It has fewer processing units, but these are of higher capacity.

latter on the site of the burned-out operation.

Also, the availability of modern, higher-capacity equipment made it possible to design a flow that would equal the highest productive rate of the former plant, but with far fewer processing units. Whereas the combined primary-secondary phases of the older facility involved nine screening units and four cone-type crushers, the new installation was built with only five screens and two cone-type crushers in the secondary phase, plus the jaw crusher of the primary. Subsequently, a third crusher was added to the secondary plant for further processing of particular materials, such as agstone.

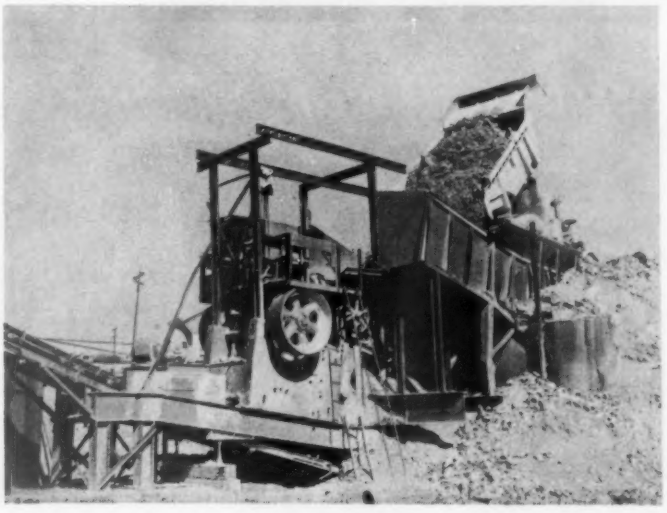
Construction of the new plant was started by a company crew in February, 1959. In October, just a year ago, the 350-t.p.h. facility was in full operation, and despite the production gap of several months, Monon came back strong in its markets. These include roadstone, ballast, concrete aggregates, and agricultural limestone. The area in which the products are sold includes a large part of northwestern Indiana, from Lafayette, north, as well as southern Michigan. Concrete aggregates in particular are shipped into the latter area. The plant is located on the mainline of the Monon Railroad, and about 60 percent of all shipments are made by rail.

Quarrying operations are currently carried out in the northern area of an extensive excavation which has resulted from more than a half-century of production. The face of the dolomitic limestone formation being worked varies from 40 to 60 ft. in height and displays well-jointed strata. The virgin stone is overlain by about 8 ft. of soil and loam.

In drilling, two Bucyrus - Erie churn drills are used to sink 6-in. holes on a 14- by 16-ft. pattern. The blastholes, 10 to 12 per shot, are charged with 40 percent gel, Trojan TL 101, or Olin Mathiesen Dynatex, and the yields average about three tons of material per pound of explosive.

Broken rock is loaded out by a 3-cu. yd. Marion 111M diesel shovel for haul to the plant hopper in end-dump Euclids. As seen in accompanying photographs, the combination of natural fractures and

In the design of the new operation, the primary phase, seen here, was separated from the following flow, as compared with the old, single plant. Products of this primary jaw crusher are conveyed, left, to a surge hopper between the two phases.



blasting leaves the minimum of material for secondary breakage.

The primary crushing installation was erected at a level intermediate between the quarry floor and the higher elevation of the secondary plant site and a short distance horizontally from the latter. Here the quarry trucks dump into the hopper above an apron feeder supplying the 3042 Universal primary jaw crusher.

After reduction through a setting of approximately 2 in., the primary crusher run is carried on a short belt to a surge hopper. It is removed from the latter by a plate feeder for transfer to the 30-in. by 340-ft. inclined belt conveyor that supplies the secondary plant. All conveyors have been standardized with Raybestos-Manhattan belting.

At the top of its run, the feed conveyor connects with a scalping tower housing a 5- by 12-ft. double-deck Simplicity scalper mounted over an Erie compartmented bin. Separation is made with a 2-in.-opening top deck, and ¾-in.-opening bottom deck. Oversize is chuted to the secondary crusher feed bin compartment, the intermediate fraction is delivered to a 36-in. horizontal belt conveyor for delivery to subsequent screening, and the ¾ x 0 fraction goes to another compartment for truck loading.

Transfer of the oversize material from its bin compartment is initiated *via* a Syntron feeder that discharges into the secondary crusher feed chute. Secondary reduction is done with a 4¼-ft. Symons standard cone crusher. Discharge from the latter joins the intermediate scalper product (2 x ¾) on the short 36-in. belt mentioned above. The latter discharges to a company-fabricated open-type bucket elevator that feeds the screening flow.

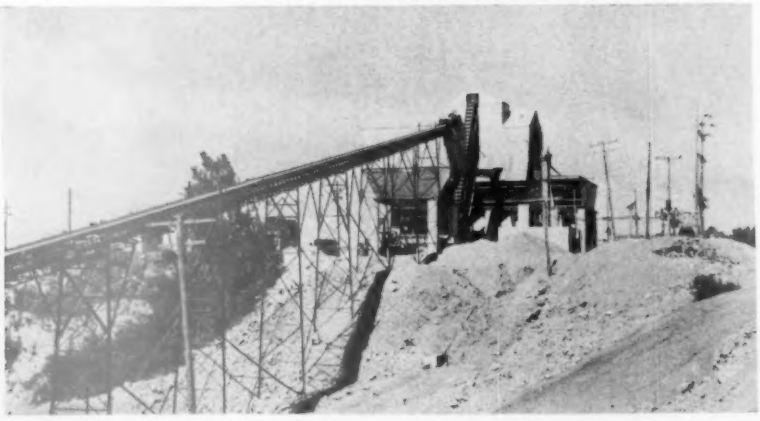
The structure housing the finish screening stage was fabricated in an unusual manner. The concrete supporting columns left standing when the old plant burned, plus a few new concrete columns, were used to support a new set of Erie bins above the rail spur. The steel legs furnished with the new bins were, in turn, erected as a screen-supporting framework above the bins. Each of the bins erected in the new plant has a 200-ton capacity, and is divided into two compartments.

At the top of the screenhouse the bucket elevator discharge is split to a pair of 4- by 16-ft. triple-deck Lippman screens. Each of these is fitted with identical Tyler screen-cloth on corresponding decks. Cloth on the lower two decks of each screen may be varied in accordance with desired product range, but the top decks are generally fitted to make a separation at 1½ in.

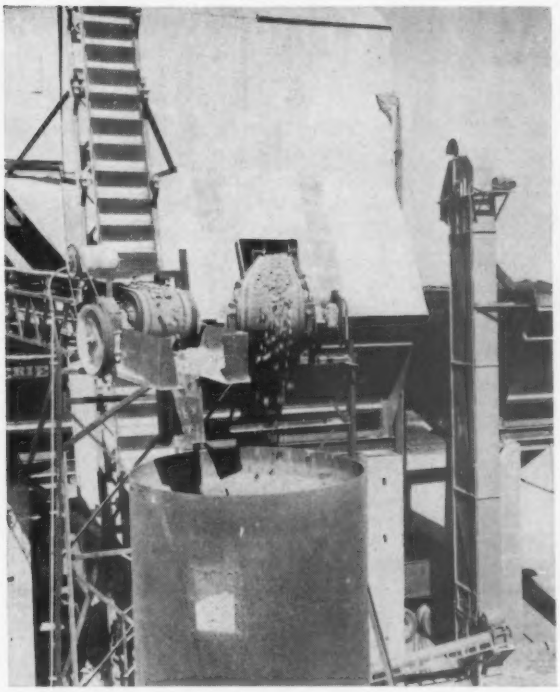
The plus 1½-in. fraction from each top deck is received on the respective one of two horizontal belt conveyors. These converge on a point outside the screen building, where they discharge together into a surge hopper above the tertiary crusher. The latter, a 4-ft. Symons short head unit, discharges to the conveyor carrying the secondary crusher product, and these materials are again delivered to the bucket elevator in closing the circuit.

Both intermediate fractions from the lower decks of the two screens above are chuted into appropriate underlying bin compartments. However, throughs passing the bottom decks flow to the corresponding one of two following single-deck Lipp-

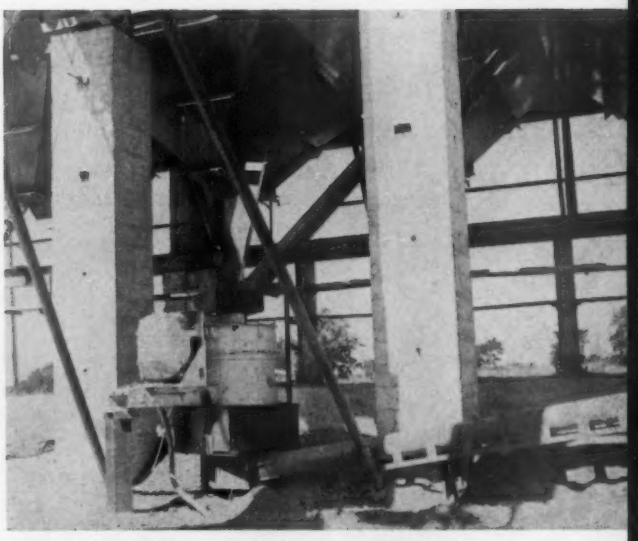
These churn drills sink 6-in. holes, normally spaced on a 14- by 16-ft. pattern.



A view of the secondary plant, seen from the primary crushing installation. The long inclined conveyor delivers material from the surge hopper of primary crusher-run.



The two conveyors returning the largest fraction from the finishing screens to the feed bin of the tertiary crusher. At the upper left is a part of the bucket elevator that supplies the finish screens.



In agstone production, material from the heated-deck screens is delivered to this crusher for fine reduction. The products are conveyed by the screw (bottom) to a closed bucket elevator for transfer to a bin.

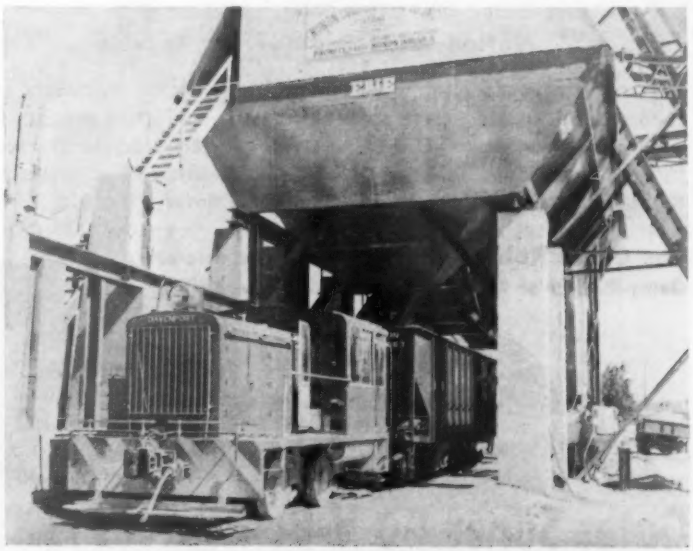
man screens fitted with $\frac{3}{16}$-in.-opening, electrically-heated screen-cloth. Heating current is provided by a Henco transformer and control for each screen.

Material retained on these screens is delivered to a 3-ft. Tornado crusher at ground level, and the products of this fine reduction (nearly 100 percent passing an 8-mesh screen) are transferred *via* screw and closed-type elevator to a loading bin.

Finished products are drawn *via* sliding gates from the bins under the finish screens for direct loading of either rail cars or trucks. A Davenport diesel locomotive is used for spotting cars (for loading) and for switching empties or loaded units. Trucks are weighed out over a Fairbanks-Morse truck platform scale.

Operations, carried out on six (or even seven) days a week as market conditions dictate, are handled by a 16-man crew headed by Nick Bozich, president, and George Bozich Jr., vice-president, designers of the plant, and Bill Bielfeldt, secretary-treasurer. This is a hard-working management team that took an almost fatal blow to their operation, and came back even stronger.

Right: This yard locomotive spots rail cars for loading and handles switching.



A close-up of the heated-deck screen installation.

Cedarapids Super Commander Portable Crushing and Screening Plant, built by Iowa Manufacturing Company, Cedar Rapids, Iowa, produces up to 500 tons of material per hour.

This high capacity V-Belt Drive handles 60% more power in 30% less space!

Gates Super HC V-Belts solve product-development problem!

Iowa Manufacturing Company was faced with a problem: Transmitting 400 hp from a higher-speed engine in a space that had been just enough for conventional V-belts carrying 250 hp.

At higher speeds, centrifugal force made larger sheave diameters impossible. A wider span of belts was ruled out by Highway Department restrictions of overall machine width to eight feet.

Iowa Manufacturing's designers solved their primary problem of transmitting 60% more horsepower with new Gates Super HC V-Belts.

Because Super HC V-Belts have smaller cross section, use narrower and lighter weight sheaves, designers also succeeded in reducing drive weight, width and height—a decided bonus in portable equipment.

Nation-Wide Engineering Service

A Gates Distributor can show you how sheave diameters can be reduced 30% to 50%, drive space up to 50%, and drive weight 20% or even more with Super HC V-Belt Drives. Ask him for your free copy of *"The Modern Way to Design Multiple V-Belt Drives"*, or write to The Gates Rubber Company Sales Division, Inc., Denver, Colorado.

The Gates Rubber Company, Denver, Colorado TPA 512
Gates Rubber of Canada Ltd., Brantford, Ontario

Gates
World's Largest Maker of V-Belts

Gates Super HC V-Belt Drives same hp capacity in smaller "package"

Enter 110 on card, page 197

Tyrone's New Plant

(*Concluded from page* 104.)

6-in. centrifugal pump. Waste water and the small amount of fines resulting from rinsing the finished aggregates before shipment go to a series of settling ponds and back into the stream. All electric motors are 440 v., except the crusher motors, which are 2,300 v.

The main office of the Tyrone Rock Products Co. is at Ocala, Fla. Officers are: W. M. Palmer, president; D. B. Kibler Jr., vice-president; and S. D. Gooch Jr., secretary-treasurer. J. F. Wilkerson is sales manager, with offices in Atlanta. John W. Hale is general superintendent. T. J. Bradberry is plant superintendent, and Coy Bryant is plant foreman.

High Ball-Clay Production Sets Top Record in 1959

Production of ball clay in 1959 increased 20 percent in quantity and 17 percent in value, compared with 1958, according to reports submitted by producers to the U. S. Bureau of Mines. Output was the highest ever recorded—475,235 short tons.

The average value per short ton for ball clay, as reported by producers was $13.59, compared with $13.86 in 1958 and $13.10 in 1955.

Imports of common-blue clay and ball clay increased 43 percent in tonnage and 48 percent in value compared with 1958. Exports increased 9 percent.

Asphalt and Products Sales Increase 9 Percent in 1959

Sales of asphalt and asphaltic products increased 9 percent during 1959—to 19,774,588 short tons, according to a survey made by the U. S. Bureau of Mines. Sales of asphalt for paving purposes increased 9 percent in 1959, compared with a 12 percent increase in 1958.

Asphalt for paving purposes continued to be the major use category and accounted for 74 percent of the total domestic sales.

Producers of bituminous limestones (native asphalt) reported sales of 1,509,277 short tons in 1959, an increase of 15 percent. Value rose from $3,218,000 in 1958 to $3,810,000 in 1959.

Enter 111 on card, page 197 →

New Conveyor System

. . . gives far greater belt life

. . . reduces maintenance

. . . and you get it *exclusively* from McNally Pittsburg

A completely new Cradle Idler* is the key to this high-efficiency McNally Pittsburg conveyor design. By mounting new 5" rubber rollers on a *nonrotating*, stainless steel rope, dangerous harmonics and "loping" are eliminated—permitting greater capacity and faster belt travel with minimum spillage. The *true catenary* of this suspension provides uniform belt support with no bends or creases—belt life is substantially increased.

Because of the unusual simplicity of this new McNally Pittsburg conveyor design, installation costs are lower—and maintenance costs are at a minimum.

* Patents Pending

New shock absorbing 5" rubber rollers have precision ground ball bearings, prelubricated and lifetime sealed.

With true catenary suspension, belts stay flat; support is uniform under all conditions for far longer belt life.

On-the-job construction is simple. The entire conveyor uses standardized components for easy assembly to fit your particular needs.

WRITE TODAY | for details on this new McNally Pittsburg conveyor which costs less to install . . . saves money every day it is in use.

McNALLY PITTSBURG

McNally Pittsburg Manufacturing Corporation—
Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
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McNally Pittsburg Mfg. Corp.
Dept. P
Pittsburg, Kansas

☐ Please send information on the new McNally Pittsburg belt conveyor.

☐ Have Sales Engineer call for further consultation.

Name_____ Title_____

Company_____

City_____ State_____

Careful Planning
Precedes Construction Of Connecticut

close supervision, adequate records ensure efficient, profitable operation

THE constantly shifting pattern of expansion and development in this country is largely responsible for the steady growth of the aggregates industries, especially in the form of new plants in areas not formerly capable of supporting one. The new 150-t.p.h. sand and gravel operation of Lambert, Inc., near Brookfield Center, Conn., is an excellent example. This plant is located in the southwestern part of the state, about 10 miles northwest of Danbury, in an area which formerly received its modest needs from various other operations around it and 10 or more miles away.

The progressive-minded owner of this operation is Robert R. Lambert, with a heavy construction contracting background in Ohio and later in Port Chester, N. Y. Always on the alert for a good business opportunity, Mr. Lambert saw a good potential aggregates market in the general area of Brookfield Center and spent two years prospecting to find a good deposit. This was then checked carefully by digging test holes and a well. Good sand and gravel was found close to the surface, and extending to solid rock 50 ft. below.

With definite assurance of an ample supply of suitable material, Mr.

In this general view of the Lambert plant the primary and secondary crushing stations are in the foreground, the scalping station in the center, and the screening and stockpiling stations in the background.

Sand and Gravel Plant

By WALTER E. TRAUFFER

Lambert went ahead with the construction of a 90-t.p.h. crushing and screening plant. This pilot operation was started early in 1959. The results were satisfactory, so early in 1960, the plant was expanded to 150 t.p.h. capacity. Sales so far in 1960 are double last year's and future prospects are good. It is a simple, straight-line operation designed to produce the several sizes now needed but is flexible enough to make any desired products with minor changes of equipment additions. This plant was designed by Mr. Lambert in co-operation with Winchell & White, Inc., consulting engineers of Wayne, N. J.

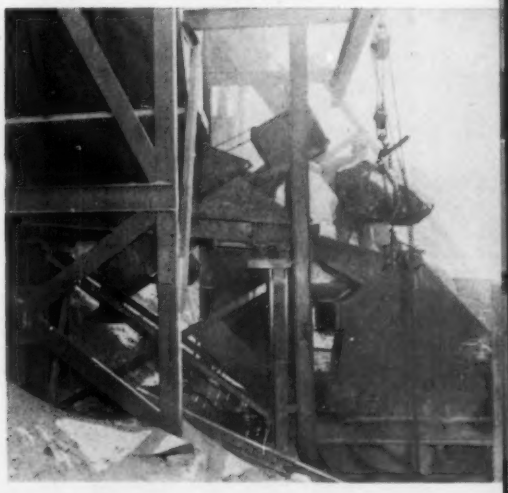
This property is within 2,000 ft. of State Route 84, a freeway connecting to New York's Taconic State Parkway and to the east. Material is being supplied to this project and it will give good access to additional markets. Other freeways are soon to be built in this area, including Route 25 southeast to Bridgeport and Route 7 north and south. About half the output of the plant now goes to the asphalt plant of Connecticut Colprovia, Inc., and the two ready-mix plants of the Telesco Fuel & Mason Supply Co., one on the property, and the other new plant on the west side of Danbury.

The deposit is a glacial moraine rising over 50 ft. alongside the valley in which the plant is located. The 1 to 2 ft. of overburden is sold as topsoil, and some of the trees removed from this area are sold. The deposit averages about 50 percent sand, and the gravel is well graded, with little over 15 by 30 in. but some boulders up to 60 in. There is some clay in the deposit and a trace of mica but these create no problem. The material meets all state and other tests, having a Los Angeles Rattler test of 34; the state maximum is 40.

Digging and loading in the pit is done with a 1-cu. yd. Lorain shovel powered by a Cummins diesel engine. A Mack 21-ton, 10-wheel end-dump truck with a heavy-duty body hauls a short distance downgrade to a 25-cu. yd. hopper. A Simplicity grizzly feeder with 3-in.

The 1-cu. yd. diesel shovel, loading a 21-ton heavy-duty truck. Note the trees in the background, which are removed and sold.

An oversize rock being removed by the chain hoist from a 30-in. primary jaw crusher. The grizzly feeder is at the left.



LAMBERT INC.
BROOKFIELD CENTER
CONNECTICUT

DAILY REPORT DATE_____

Production time _____
Man Hours _____
Production Time To Date _____
Man Hours To Date _____

Sales In Tons SAND _____
3/8" Stone _____
3/4" Stone _____
Dollar Value _____

Sales To Date SAND _____
3/8" Stone _____
3/4" Stone _____
Dollar Value To Date _____

Loads of Material Thru Plant _____
To Date _____

Non Operating Time _____
Non Operating Time To Date _____

- Explanation -

MATERIAL TEST

SAND		SPEC	3/8"		SPEC	3/4"		SPEC
3/8	_____	100	1/2	_____	100	1	_____	100
4	_____	95-100	3/8	_____	90-100	3/4	_____	90-100
16	_____	45-80	4	_____	0-20	1/2	_____	10-40
30	_____	20-55	8	_____	0-5	3/8	_____	0-20
50	_____	10-30	100	_____	0-1.5	4	_____	0-5
100	_____	2-10						

REMARKS -

Figure 1 and Figure 2 show the two sides of the order form (8 by 10½ in. for convenience in filing).

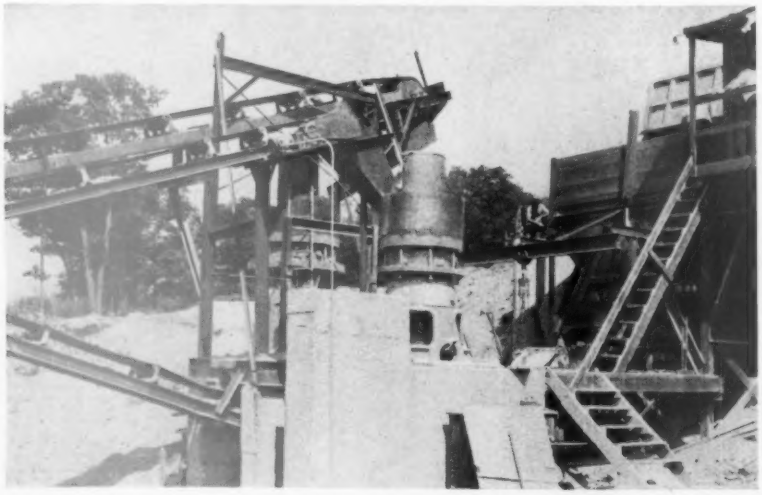
openings feeds to the 15- by 30-in. Kue-Ken primary jaw crusher. This is V-belt driven by a 35-hp. motor. The minus 3-in. grizzly throughs cushion the impact of the minus 5-in. crusher product on belt conveyor No. 1 to the scalping station.

This 24-in. by 90-ft. belt feeds to the 5- by 12-ft. Simplicity single-deck scalping screen which has 8 ft. of 7/8-in. and 4 ft. of 2-in. wire cloth. The 2- to 5-in. oversize is carried on a short belt to a No. 37½ Kennedy-Van Saun gearless gyratory crusher driven by a 75-hp. motor. The 2-in. to 7/8-in. throughs are carried on another belt to a No. 25½ Kennedy-Van Saun crusher driven by a 40-hp. motor. These crushers are set to reduce to 7/8-in. and ⅜-in. minus, respectively, and both discharge back on belt conveyor No. 1.

The minus 7/8-in. material through the scalping screen is fed by a short belt on a 24-in. by 110-ft. conveyor to the final screening tower. There it is discharged on a 5- by 12-ft. Simplicity single-deck sand scalping screen equipped with sprays and 3/16-in. wire cloth. The oversize, ¼- to ¾-in., drops to the 4- by 10-ft. Simplicity final sizing screen. This has ½-in. and 3/16-in. wire cloth on its top and bottom decks, respectively, and is also equipped with washing sprays. A third deck can be put on this screen when another product is needed, and there is room for another conveyor and stockpile.

The material off the top deck of this screen is carried on an 18-in. by 100-ft. belt conveyor to the ¾-in. stockpile. That over the second deck goes *via* an 18-in. by 153-ft. belt to the ⅜-in. stockpiles. Each pile will store 20,000 tons of material without rehandling.

The sand through both screens flows with the water into a circular tank over the 36-in. by 25-ft. McLanahan & Stone single-screw washer. The product is discharged on a 24-in. by 110-ft. inclined belt conveyor which discharges to a 24-in. by 215-ft. horizontal stockpiling conveyor. This is reversible and can discharge at either end, and, by means of a plow at three intermediate points, form a 40,000-ton stockpile. Only concrete sand is now be-



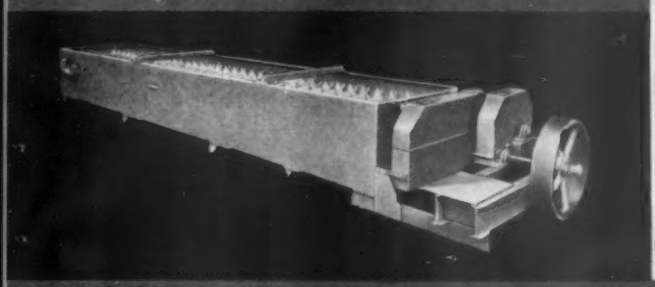
These two gyratory reduction crushers receive material from the scalping screen on separate belts and feed back onto the main belt from the primary crusher at the right.

Enter 115 on card, page 197 →

In Standard Materials Corporation's Marywood (Indianapolis) plant, two 10" x 30' McLanahan Log Washers.

In the Plainfield, Indiana plant, a 10" x 25' Log Washer.

In the Clinton, Indiana plant, a 10" x 25' Log Washer.



Fundamentals with McLanahan Mudmasters—cleaner product, profitable tonnages, up to 40% lower power requirements, compared with other types of washers.

Selected by

STANDARD MATERIALS

not once but

11 times

This progressive Indiana and Kentucky operator selected eleven McLanahan Log Washers for installation in seven gravel plants. *May we send Technical Bulletin MM-90 on Mudmaster Log Washers?*

McLANAHAN SINCE 1835

LOG WASHERS

In the Milton, Kentucky plant, a 10"x30' McLanahan Log Washer.

At Burlington, Kentucky, a 10" x 30' and a 10" x 25' Log Washer.

In Standard Materials' 86th Street (Indianapolis) plant, a 10" x 25' McLanahan Log Washer.

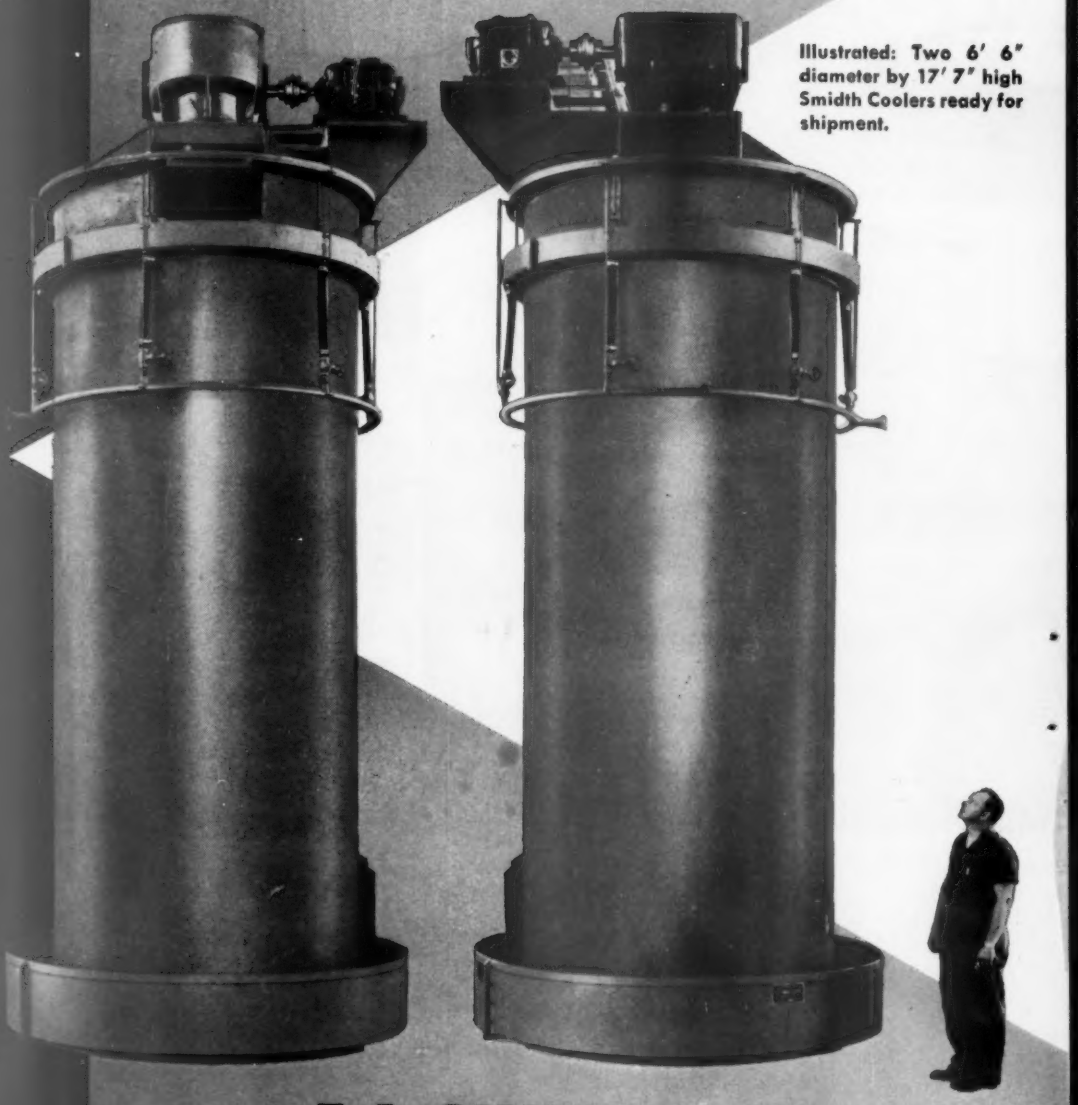
In the Speedway (Indianapolis) plant, a 10" x 30' and two 10" x 25' Logs.

Smidth

CEMENT COOLERS

The Smidth Cement Cooler, developed especially for cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging, is externally water-cooled. The hot cement is introduced at the base and conveyed in a thin layer along the cooled interior surface to the top. High cooling efficiency is assured by the intimate contact of cement and the water-cooled surface.

The Smidth Cooler may also be used with many other similar dry pulverized materials.



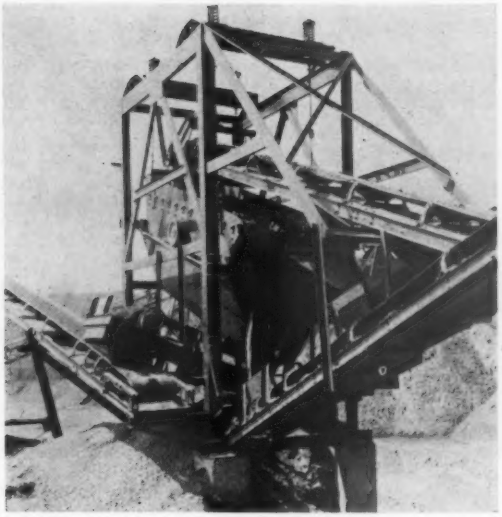
Illustrated: Two 6′ 6″ diameter by 17′ 7″ high Smidth Coolers ready for shipment.

F. L. SMIDTH & CO.

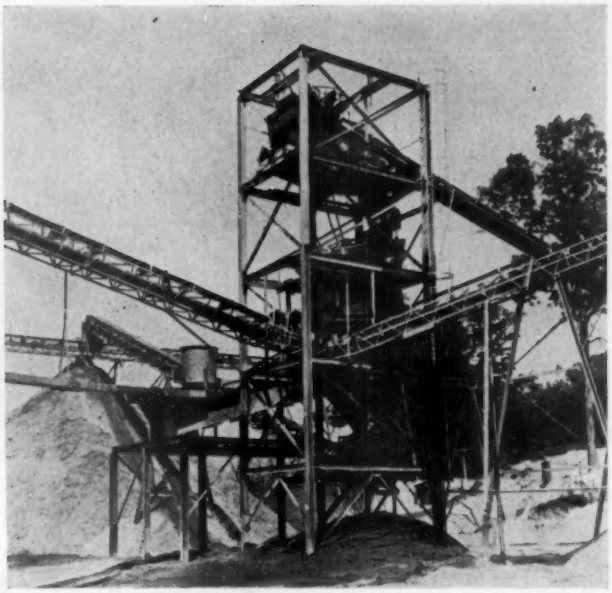
INCORPORATED

ROCKEFELLER CENTER

1270 Ave. of the Americas, New York 20, N.Y.



The 5- by 12-ft. single-deck scalping screen, which returns two coarse sizes to the secondary crushers.



The screening tower, with the two sizing screens and the sand screw washer all arranged for gravity feed.

ing made. A second washer, with conveyor and stockpile, can be added when more sand capacity is necessary or when a market for mason's sand is developed.

In order to run a business successfully Mr. Lambert believes that it is necessary to keep a close watch on production, costs, down time, sales, etc. Close control of these important factors is made possible by a simple daily report which yet contains all the necessary information (Fig. 1). This information is cumulative and forms the basis for monthly and annual reports. It provides a running guide on operating efficiency, costs, profits etc., and on the necessity for overtime operation. It also provides a perpetual inventory and is helpful in making sales forecasts.

In order to insure a consistent high quality of product, tests of the two gravels and sand are made daily with a set of Soiltest, Inc., sieves and shaker. This information is entered on the back of that day's report (Fig. 2) to provide a complete record.

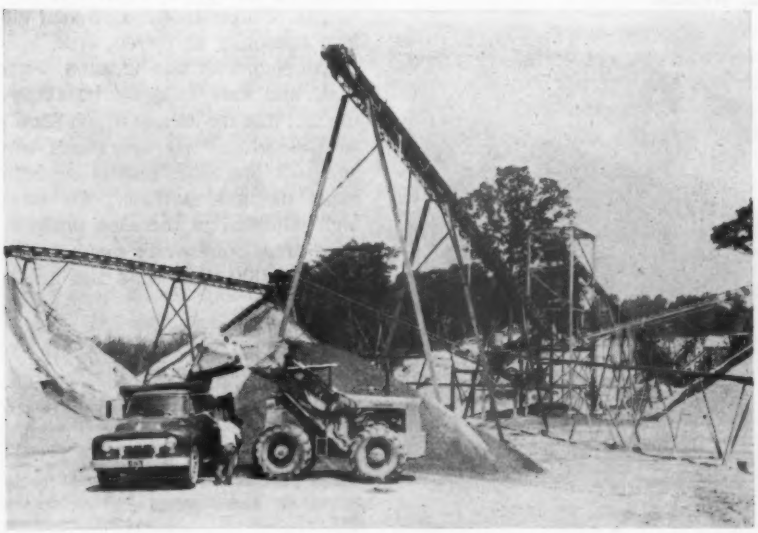
Trucks are loaded from the stockpiles by a 2¼-cu. yd. Tractomotive front-end loader. A 50-ton capacity Howe truck scale is used to weigh out all shipments, including topsoil. All sales are made f.o.b. plant.

All operations are controlled from the primary crusher station. The entire crew, including the pit, loading, etc., consists of five men. Mr. Lambert personally supervises the operation of the plant, sales, etc., with the help of Clinton A. Ames, office manager.

Only 440-v. current is used. According to Mr. Lambert, this requires smaller wire, resulting in greater operating economy and lower power cost. The plant has a total of 295 hp. installed, including the pumps, etc. Hewitt-Robins conveyors and U. S. motors predominate.

Wash water is supplied from a pond by a 5-in. Goulds pump, driven by a 35 hp., 3600 r.p.m. motor. The pond is supplied from swamps below the plant. Waste water goes to a settling pond.

This view shows the stockpiling arrangement, with the gravel stacker conveyors in the foreground and the special sand storage conveyors in the background. In the foreground the front-end loader is loading a truck.



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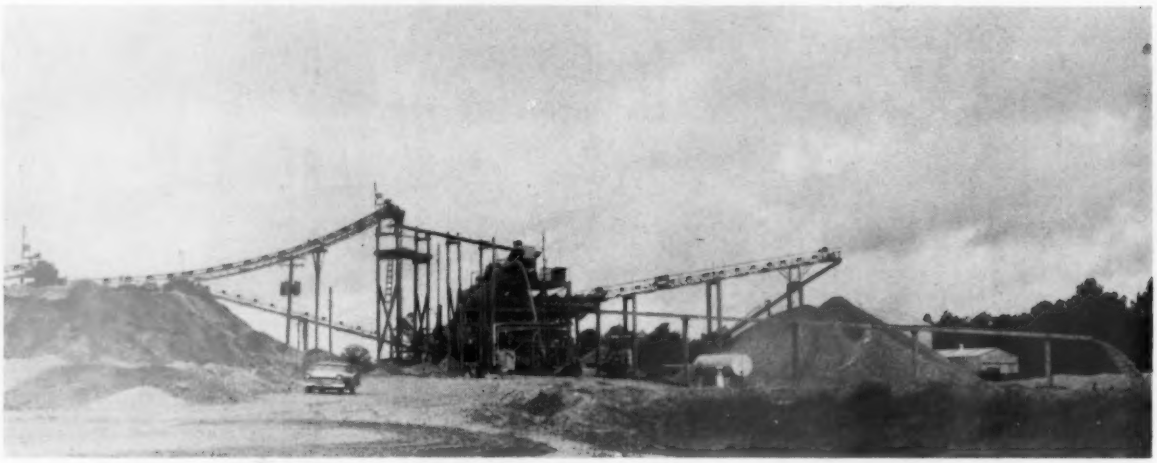
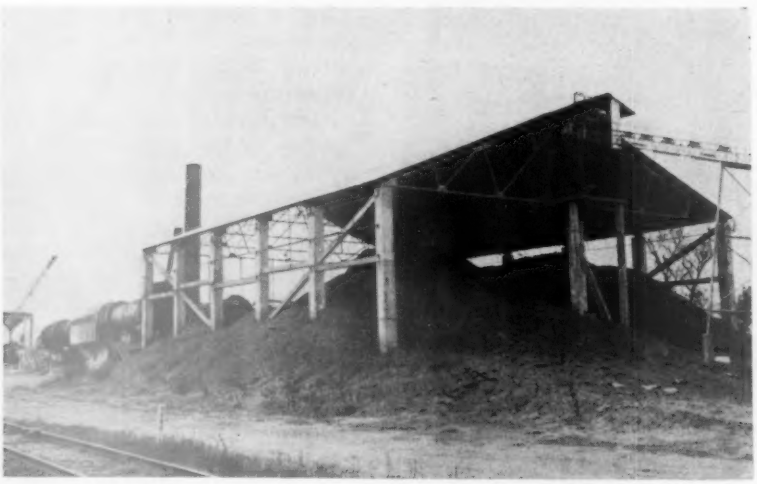


standard and lightweight

• New Arkansas producer builds two plants to process sand, gravel, clay for widespread markets

By BUREN C. HEROD



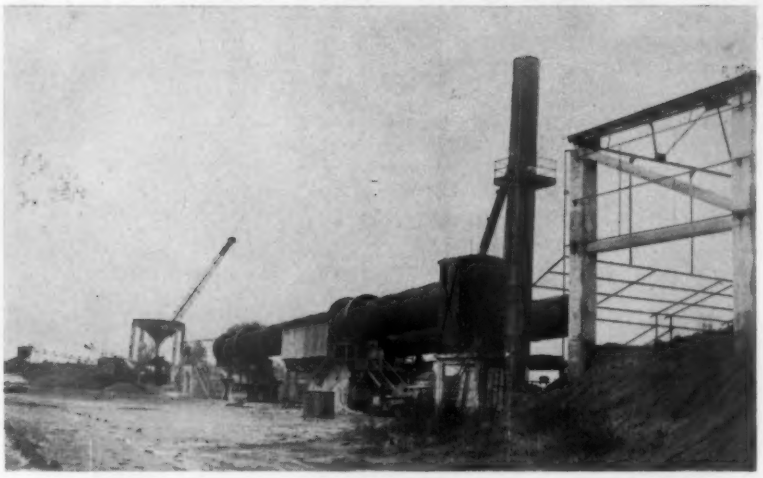
ANOTHER ON THE SPOT report

DIVERSIFICATION of product is not uncommon among the industry's aggregate producers. But not many find themselves in the position of being able not only to process both standard and lightweight aggregates, but to extract the different raw materials required from the same property. This dual advantage is enjoyed, however, by Southwest Concrete Materials Corporation, a 3-year-old firm operating at Poyen, Ark.

Coupled with this unusual situation, and enhancing its benefit, is the fact that the area in which Southwest developed its operations was an open one with respect to both materials and markets. To meet high potential in the then undeveloped area, Southwest's management built a 1,000-t.p.d. sand and gravel

Sized, raw clay feed for the kilns is stored in this shed. As delivered from the dump hopper on the conveyor at upper right the clay is reduced in a shredder at the discharge point of the conveyor before being placed on a distributing belt under the shed roof.

Opposite page: The sand and gravel plant, rated at 1,000 t.p.d., was designed with the same objective as the lightweight aggregate plant—maximum output with the minimum number of processing stages.



Right: Two kilns, each 8 by 125 ft., provide a capacity of 600 cu. yd. per day in expanded-clay lightweight aggregates. In the background beyond the kilns is the crushing and screening installation.

aggregates from materials in single pit

plant and a 2-kiln, 600-cu. yd. per day lightweight aggregate plant which were placed in operation just over two years ago.

With these facilities the firm is supplying lightweight materials under the trade name of "Feather-Rok" for concrete masonry and structural concrete needs, primarily by rail shipment, within a radius of 150 miles; the sand and gravel is marketed basically for ready mixed concrete and road materials, with shipment largely by truck, to customers within a 100-mile radius.

The exceptional deposit from which the two operations are supplied contains a bed of sand and gravel about 12 ft. thick above clay. The latter was found to have good bloating characteristics, a fact which fostered the plans for diversified production when the company was organized. Efforts toward attaining this objective were furthered by the experience of the new firm's president, Rolland Brown, who had formerly been in the lightweight aggregate business in Ohio.

In designing the operations, management was assisted in laying out the kiln installation by the Kennedy-Van Saun Mfg. and Engr. Corp. staff. Local engineers furnished help in planning the sand and gravel plant. The lightweight aggregate plant was erected on a site close to the mainline of the Rock Island Railroad, which borders the property; the sand and gravel plant was built near the pit area. Both were designed to incorporate uncomplicated processing systems, and to attain maximum output of quality materials with minimum processing.

In the pit, the sand and gravel and also the underlying clay are recovered by a Koehring dragline. Logs of drillholes sunk throughout the nearly 600 acres in the property show clay to be present to a depth of more than 100 ft. Currently, this material is removed to a depth of approximately 12 ft., about the same as the overlying sand and gravel; and as pit-run plant feed, it has a moisture content averaging 18 percent. The sand and gravel is also an excellent raw material, being well graded and containing only a nominal amount of gravel larger than 2 in.

As recovered, the sand and gravel is trucked a short distance to the gravel plant feed hopper; the clay is hauled about one-half mile to the kiln installation. At the latter, the clay is dumped into a truck ramp hopper, from which it is transferred by a Cedarapids apron feeder and a 24-in. inclined belt conveyor to a double-roll Brown clay shredder. This unit, installed at the discharge point of the inclined conveyor, reduces the feed to a top size of 2½ in. This product is received on a distributing belt.

The latter is housed, as shown in an accompanying photograph, near the top of a storage structure that provides cover for about 5,000 cu. yd. of material. Recovery of the clay for further processing is made with a Sauerman drag scraper, which draws the material from any part of the storage building to a hopper at one end.

A Waytrol regulated Syntron belt feeder then delivers the clay at about 15 t.p.h. to a 24-in. belt conveyor. The latter, in turn, discharges to a bucket elevator that supplies the feed tube of one of the two kilns. (A similar system, not yet in operation at the time of the writer's visit, will deliver feed to the companion kiln.)

The first kiln in operation, an 8-by 125-ft. Vulcan unit, rides on two tires and is driven by a 35-hp. motor. A Hercules engine is provided for auxiliary drive. The second kiln, made by Standard Tool

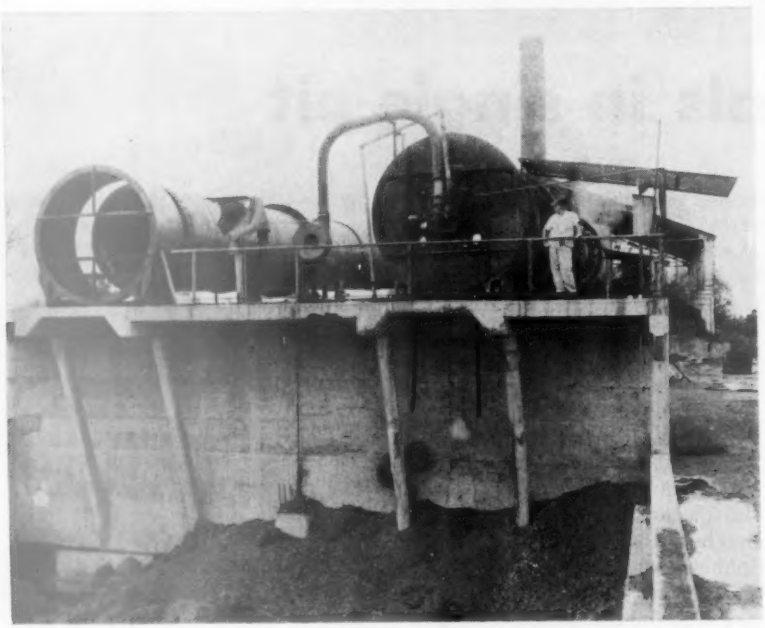
Above: A drag scraper system recovers the clay from the 5,000-cu. yd. storage for transfer to conveyors (right) that supply the kiln feed bucket elevators.

& Design, has the same dimensions as its companion.

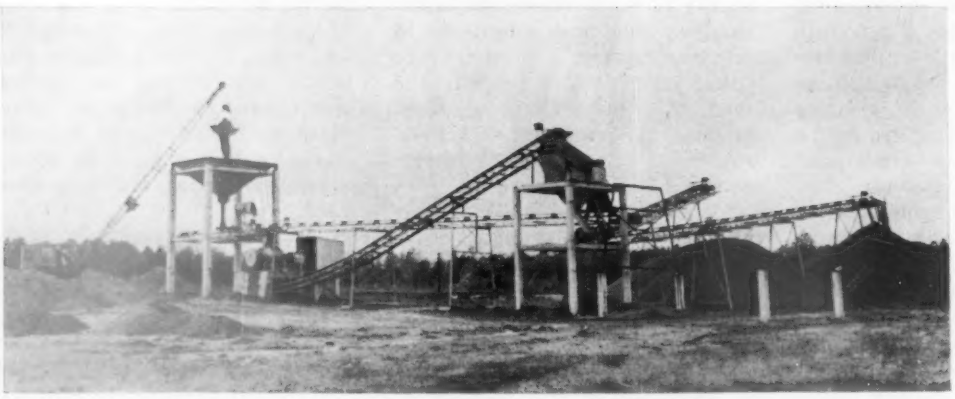
Firing is done with natural gas through Hauck burners. Bloating temperature of about 2,150 deg. F. is monitored by a Minneapolis-Honeywell optical pyrometer. A concrete pit common to the discharge ends of both kilns receives clinker from them before the processed material is recovered by a Koehring 405 clamshell machine for transfer to a cooling stockpile.

Cooled clinker is rehandled by the same clamshell into a hopper above a 100-hp. Williams Jumbo hammermill. Products of this reduction are carried on an 18-in. belt conveyor to a 4- by 10-ft. Hewitt-Robins triple-deck screen for sizing. Those fractions retained on the ¾-in. opening top deck and ⅜-in. middle deck of the screen are returned to the hammermill in closing the crushing circuit. The two factions separated on the screen's $\frac{3}{16}$-in. bottom deck are separately conveyed to stockpiles.

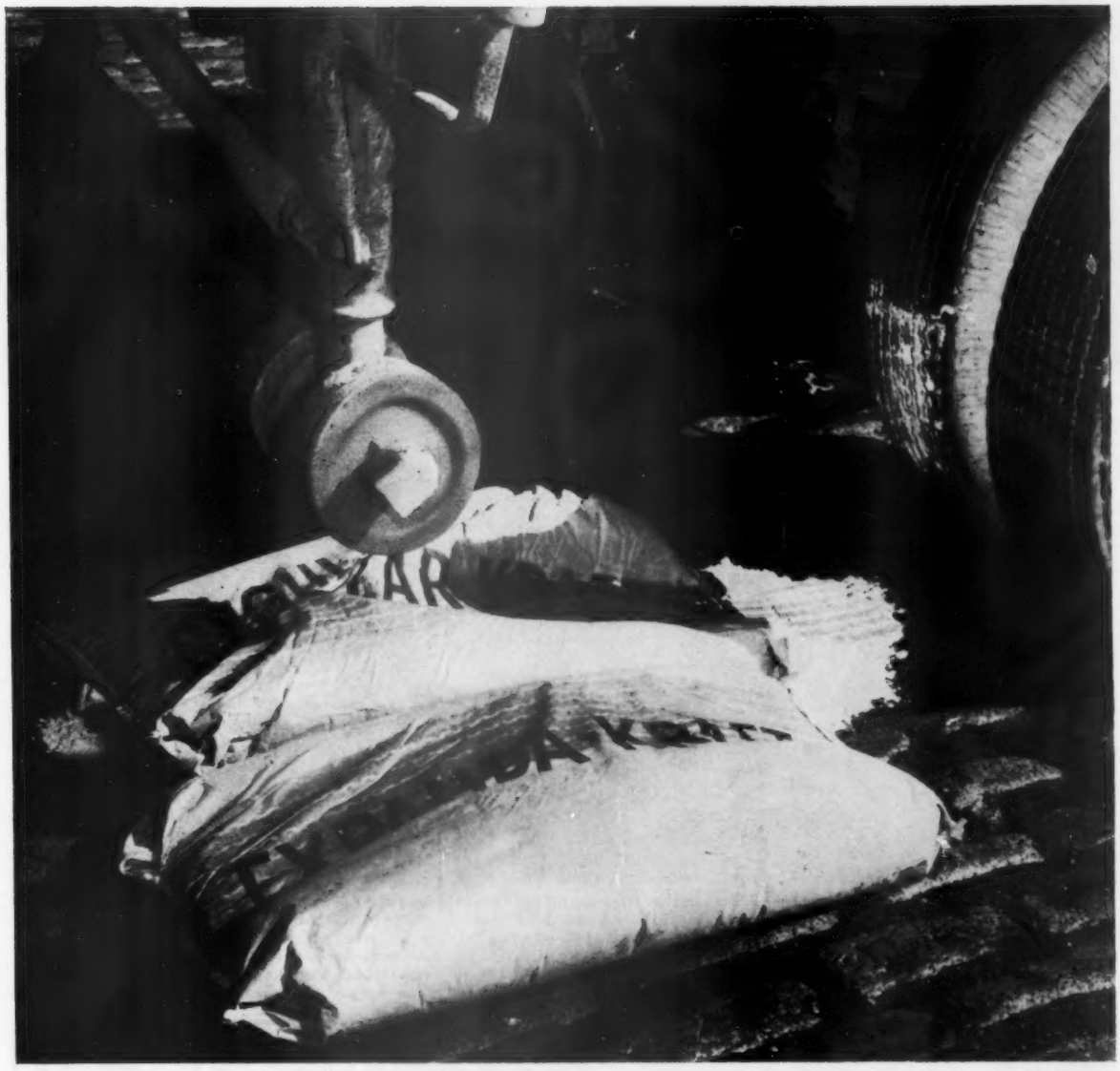
Plans have been made for the future installation of a tunnel housing weigh feeders for the recovery and loading of finished materials. Currently, the clamshell is employed to rehandle the aggregates for direct loading into railroad cars, and for feeding a truck-loading hopper. As a part of the future project, a second screen will be installed above the



Left: Expanded-clay clinker is discharged into this pit, lower foreground, from the kilns. (The unit at the left was under construction at the time this photo was taken.) The clinker is removed from the pit and placed on cooling piles.



Crushing and screening of the expanded aggregate material is done in this installation. At the left, a clamshell is filling the hopper above the crusher with clinker from the cooling piles. After sizing on the screen, right center, the finished products are stockpiled, right.



One bag broke . . . the other has two-way stretch

The one with stretch is made of H&W's new, high-strength Expanda Kraft.

A large tractor-trailer ran over both bags of equal weight and plies. The regular kraft bag burst under pressure—see the tell-tale flour on the inside tire tread. But look at Expanda Kraft —*not a sign of breakage!*

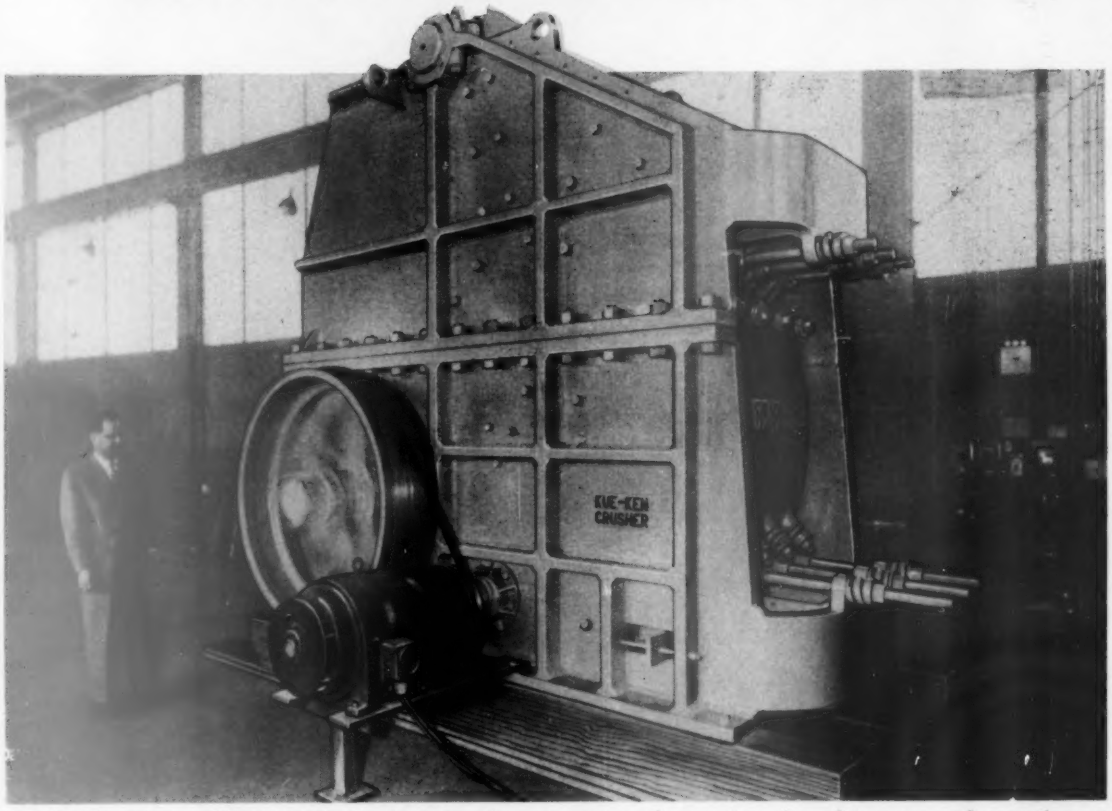
Expanda Kraft is stronger, because it's made by a special roll-crepe process. It's resilient, has two-way stretch, and soaks up shock. And Expanda Kraft is available in white, semi-bleached and natural.

Expanda Kraft comes in 40, 50, 60, 70, 80 and 100-pound basis weights. *For samples and information*, write Hollingsworth & Whitney, Division of Scott Paper Company, Chester, Pa.

Safeguard your product in **EXPANDA KRAFT®**

HOLLINGSWORTH & WHITNEY DIVISION OF
SCOTT PAPER COMPANY

KUE-KEN® "crushing without rubbing" saves power . . . lengthens jaw plate life at least 5 times!



KUE-KEN "crushing without rubbing" eliminates the main cause of premature jaw plate wear and excessive power consumption. Power that is wasted by conventional crushers in wearing out jaw plates is profitably used by KUE-KEN in crushing rock! The jaw plate sections of this massive 48" x 42" KUE-KEN are reversible and interchangeable for maximum utilization. With KUE-KEN, jaw plates cease to be a major maintenance and downtime factor.

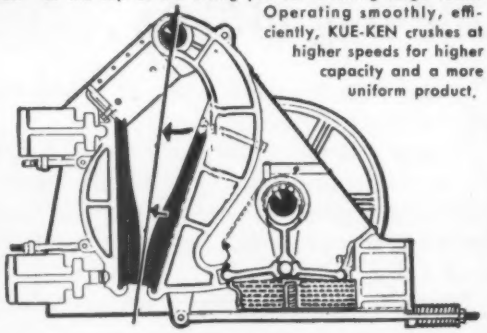
KUE-KEN operates on a smaller motor. With a pendulum type swing jaw that does not have heavy reciprocating parts to lift, KUE-KEN is driven by a single lightweight flywheel powered by a normal duty squirrel cage motor. In shop test, the 48" x 42" KUE-KEN crusher above is started by a 30 hp motor with a single vee belt and runs mounted on skids not fastened to the floor at the operating speed of 275 rpm on only 17 hp!

KUE-KEN precision machined toggle mechanism operates in a sealed, filtered oil bath to reduce wear and friction to the absolute minimum. Power that is wasted in non-sealed, dirt-catching mechanisms is fully utilized by KUE-KEN in crushing rock.

KUE-KEN provides positive protection against damage by tramp iron. An automatic, adjustable safety release integral with the flywheel ends shearing or breaking parts. Production is resumed in minutes.

33 sizes of KUE-KEN Crusher are available from 12" x 7" to 48" x 48".

In KUE-KEN "crushing without rubbing," the pendulum type jaw supported on a stationary hinge pin in center line of the crushing zone provides maximum leverage where it counts most—at the top of the swing jaw for crushing large rocks. Operating smoothly, efficiently, KUE-KEN crushes at higher speeds for higher capacity and a more uniform product.



KUE-KEN® CRUSHERS

"CRUSHING without rubbing"

STRAUB MFG. CO., INC. 8381 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

DEALERS:
SEATTLE, WASH., Washington Machinery Co. • BUTTE, MONTANA, Hall-Perry Machinery Co. • VANCOUVER, B. C., Universal Equipment Co. • SALT LAKE CITY, UTAH, Lund Machinery Co. • SAN ANTONIO, TEX., Clesner Equipment Co. • LOS ANGELES, CALIF., Garlinghouse, Freman Co. • SAN FRANCISCO, CALIF., Aggregate Engineers, Inc. • PORTLAND, OREGON, Air-Mac, Inc. of Oregon • BISMARCK, NORTH DAKOTA, Midwest Equipment Co. • PHOENIX, ARIZ., Road Machinery Co.

Above, left: A closeup of the clinker crusher, which is driven by a 100-hp. motor.

Above, right: This 4- by 10-ft. screen separates all plus ⅜-in. material for return to the clinker crusher in closed circuit. The finished fractions are placed on stockpiling belts.

Right: In the pit, a part of which is visible in the background, about 12 ft. of sand and gravel and the same thickness of underlying clay are removed for feed to the two plants. At right center is the feed hopper for the sand and gravel plant.

truck hopper to assure positive size control.

Operated by a 15-man crew (including truck drivers), the lightweight aggregate installation is in production around the clock, and seven days a week.

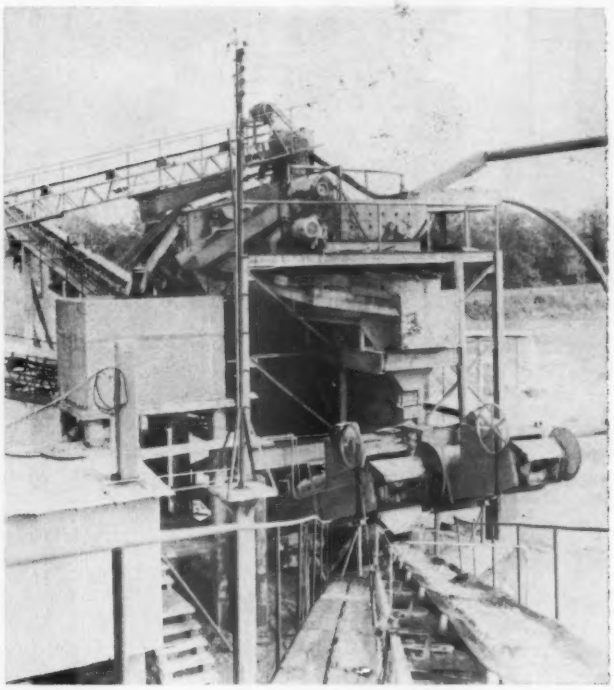
As noted earlier, the companion sand and gravel plant is located close to the pit area. Although the initial operation had been supplied by pumping, this method was replaced at an early date by dragline excavation and truck haul. The trucks dump into a hopper near the plant, and the pit-run material is transferred by a reciprocating plate feeder to a 24-in. inclined plant feed belt.

This flow is discharged into a slurry box preceding the top screen, where it is joined by a flow of water. The slurry then is flumed to a sluice box at the feed point of a 4- by 10-ft. Cedarapids triple-deck screen. Separation is made on 1¼- and $^{9}/_{16}$-in. opening cloth on the top and middle decks, respectively, the bottom deck being split between $^{3}/_{16}$- and ⅛-in. openings.

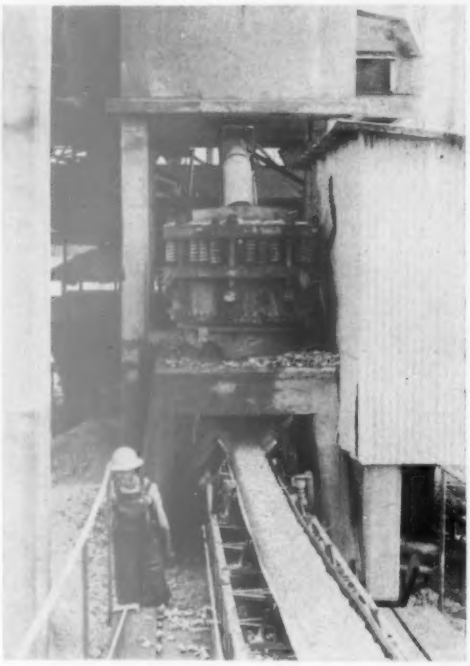
Plus 1¼-in. top size material is chuted to a hopper from which it is fed to subsequent crushing and screening stages. The middle deck fraction is chuted to a 24-in. belt conveyor for delivery to a stockpile of concrete rock. Pea gravel retained on the bottom deck of this primary screen is also delivered to a 24-in. stockpiling conveyor, while the throughs, with wash water, are flumed to an 8-port Eagle Iron Works scalping tank.

Sands drawn from the collecting flumes of the latter are delivered to a pair of 36-in. single-screw Eagle classifiers. One of these possesses mason's sand, which is discharged

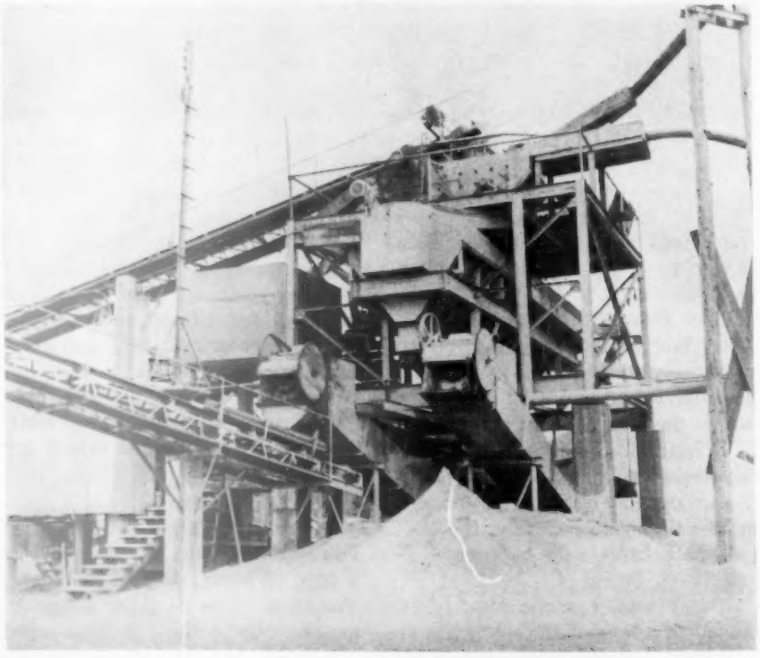
The main section of the sand and gravel operation. A slurry of pit-run material and water is delivered to the primary screen through the pipe, top right. Below the screen are the scalping tank and a pair of single-screw classifiers.



This 36-in. reduction unit is installed in the flow between the primary and secondary screens. It receives oversize from the former through the feed hopper, upper center.



The screw classifier on the left processes concrete sand; that on the right delivers mason sand. Both units are fed from the scalping tank under the screens.



Superintendent Billy McGarrity heads the crews of the two aggregate producing facilities at Poyen.

directly onto a ground pile; the other unit, processing concrete sand, discharges to a 24-in. stockpiling conveyor.

In the crushing and secondary screening circuit noted above, the plus 1¼-in. gravel is transferred from the crusher feed hopper to a 36-in. Telsmith Gyrasphere. This 50-hp. crusher is set to deliver a $^{9}/_{16}$-in. product. Crushed gravel is then transported *via* 24-in. belt conveyors to a 4- by 10-ft. double-deck Hewitt-Robbins screen.

Separation in this stage is made on ½- and $^{3}/_{16}$-in. opening cloth. Both retained fractions are again conveyed to stockpile, and the minus $^{3}/_{16}$-in. throughs are delivered to the scalping tank. Flopgates in the discharge chutework of the above screen permit blending of materials to either stockpiling system.

With the two screens and one crusher described above, the processing flow will deliver seven grades of gravel aggregate. One of these is 100 percent crushed seal chips for bituminous mixing operations. Desired graduation of products is attained by the installation of appropriate screening surfaces — Simplicity cloth is used throughout— and the crusher setting is left undisturbed.

To assure that absolutely clean water is delivered to the screening and classifying equipment, a settling area was created in a remote port of the worked-out pit, and clear water is tranferred by a 5-in. pump to a reservoir near the plant site. A 41 in. pump transfers water from the latter for both washing and mixing with the pit-run plant feed in the slurry box.

In addition to the main processing units described above, material conveying systems throughout both the sand and gravel and the lightweight aggregate operations are comprised primarily of Hewitt-Robins components and belting. Rehandling of finished sand and gravel products for truck loading is done with a Tractomotive tractor shovel.

Operations of the sand and gravel plant are normally carried out through a five-day week by a crew of five men. The latter, plus the lightweight aggregate operation crew, involve a total of 21 plant employees, who are under the direction of Billy McGarrity, general superintendent.

Management of this new diversified producer is headed by Mr. Brown and Clint Albright, secretary-treasurer.

1959 Lime Output Up 18%— Many New Plants Added

During 1959, 18 percent more lime was manufactured than in 1956, the previous record year, according to reports released by producers to the U. S. Bureau of Mines. Total United States production of open-market and captive lime in 1959 was 12,500,000 short tons, or 36 percent more than the 9,200,000 short tons reported for 1958. Open-market lime increased 14 percent, reflecting improved economic conditions. Captive lime increased 125 percent, primarily because of more nearly complete coverage of lime production for use in manufacturing alkalies. Open-market lime constituted 67 percent of the national total, and captive lime accounted for the other 33 percent.

All major use categories of lime increased over 1958, except for agricultural, which remained nearly the same. Construction lime was up 10 percent; chemical and industrial lime, up 46 percent; dead-burned dolomite or refractory lime, up 20 percent; and agricultural lime, down less than 1 percent. Quicklime comprised 62 percent, hydrated lime 22 percent, and dead-burned dolomite 16 percent of the total lime production.

The persistent trend of the last 50 years of a reduction in the number of lime plants in the United States was reversed in 1959. The number of operating lime plants in the United States remained constant at 146 during 1957 and 1958; lime plants that went out of production were offset by new lime plants that began producing. In 1959 the total number of plants was 156.

Ohio, Missouri, and Pennsylvania continued to be the three leading lime producing states. Next five ranking states were New York, Michigan, Texas, Virginia, and Illinois.

The average national price for all open-market and captive quicklime and hydrated lime combined, f.o.b. plant, excluding cost of container, was $13.13 per ton in 1959.

ONE SIMPLIFIED SYSTEM

CONVEYS WEIGHS CONTROLS

SAND GRAVEL CEMENT Operations

CON-O-WEIGH is the one package system that weighs . . . controls (feed rate, load, speed) . . . and records data for conveyor-carried bulk materials. This precision mechanism insures record tonnages in sand and gravel production through automatic weighing of material in process. In complex operations, such as batching, the CON-O-WEIGH System is the ideal, job-proved way to reduce costs, maintain quality control and eliminate production line tie-ups.

Facts and figures promptly available on how to equip new or existing plants with . . .

CON-O-WEIGH

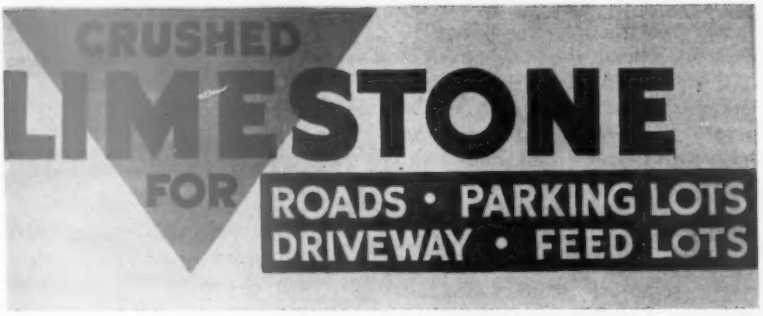
INDUSTRIAL PHYSICS and ELECTRONICS CO.

470 So. 10th East DAvis 8-8678
Salt Lake City 2, Utah

Enter 125 on card, page 197

Agstone Use Boosted by

1



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DEVELOPMENT of the latest in its annual series of promotional billboard posters has been completed by the Iowa Limestone Producers Association, Inc. The 1961 series is the twelfth in a program which officers of the association have described as producing outstanding results, in terms of both promotion of the poster themes and in identification of the limestone producers in the public mind.

On the premise that these colorful impressive reminders will serve to focus the attention of both the farmer and the general public of the benefits of applying lime to the soil, the association has always made the latter a basic feature of the billboard series. In view of the fact that the association's goals have been expanded in recent years to further the interests of all the state's limestone producers, the 1961 series is also slanted to direct public attention to the over-all importance of this vital industry.

In this series, some emphasis has been given to timeliness of agstone application by means of the overlay of the words "Test Now" on three of the posters. This is to emphasize to the farmer the importance of getting a soil test as early as possible, so that it will have been done and will not delay liming

1. The January-February poster carries an arresting message. It emphasizes the long-range result of liming as a financial gain, and plays down the cost factor.

2. Typical uses of crushed limestone are spotlighted in the poster for the second period, March and April.

3. Two pastures pictured on the May-June poster suggest the difference between unlimed and limed land, and benefits of the latter.

Billboard Posters

when he is ready to proceed.

Available to association members and other interested groups in the state, as well as to out-of-state producers or organizations, the annual billboard series involves a set of six posters, such as those for 1961 shown here. Each is displayed for a 60-day period, and carries the name of the participating producer or group in large letters just under the illustration. Finished in attractive colors, the posters are designed for ready visibility at distances of 100 yards or more from the highway.

After contacting an outdoor advertising firm for rental of billboard space in a desired area, producers or other interested groups may obtain the posters from the Iowa association. The latter will ship them directly to the designated billboard company. The cost for a full year of this advertising and promotional program is reported to be slightly more than $1 a day—with the message being delivered 365 days.

Limestone producers in other areas may obtain further information on this activity by contacting Robert L. Miller, executive secretary, Iowa Limestone Producers Association, Inc., 401 Teachout Building, Des Moines 9, Iowa.

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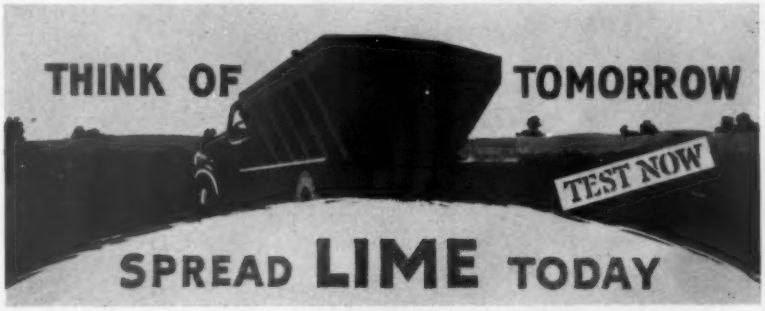

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6

4. During July and August the association features its name, seal, and slogan on the poster in a most effective manner.

5. The September-October poster calls attention to the necessity of planning ahead in the boldly spelled-out message, and the reminder to "Test Now."

6. No industry- or product-slanted message appears on the November-December poster, so that the spirit of the season will take precedence.

FROM THE BRITTLE COLD OF MINNESOTA'S MESABI RANGE
TO THE SOFTENING HEAT OF FLORIDA'S PHOSPHATE MINES—

Anaconda's new all-butyl Shovel Cable passes every life test

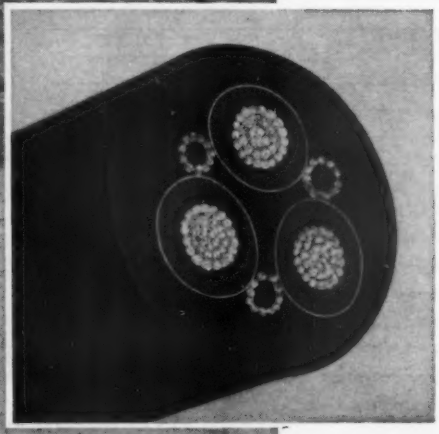
Heat, cold, kinks, even runovers and rock falls couldn't knock out this new shovel cable during months and months of torture-testing around the country.

That's because its new all-butyl *insulation* and *jacket* make it the toughest shovel cable you can buy. And—one of the most economical over the long haul. Anaconda's new process butyl—as an insulation—has proved its ability to take pinching, crushing and the effects of moisture and ozone in many fields—from extra-high-voltage power cable to surface mining. And now it's available to you as a *jacket* in Anaconda's new shovel-cable construction.

Because of its superb service record, the inner construction of this new cable remains the same. For example, you still get Anaconda's patented rubber-core grounding conductors which minimize wire breaking and offer greater ground protection. Also included are special shields of copper cross-braided with cotton—a construction which makes the braided shield lie flatter and eliminates chafing. In addition, this feature makes for much easier and faster splicing. Both electrically and mechanically, Anaconda shields are superior to all-metal construction.

Only Anaconda offers you this job-tested shovel cable with all these construction extras in a proven design. Add up the features—they mean extra cable life and dollar savings.

So, call the Man from Anaconda and ask him about the new Anaconda all-butyl Shovel Cable. Or write: The Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.



ASK THE MAN FROM

ANACONDA®

ABOUT THE ALL-BUTYL SHOVEL CABLE

Another New Product From Anaconda's Rubber Cable Center

Note the heavy-duty weather-resistant butyl jacket—the rubber core grounding wires—also see how the ground wires make constant contact with conductor shields.

Enter 128 on card, page 197

what you need to know to
CONTROL YOUR PERSONNEL COSTS

Are you certain that your personnel classification is accurate?
What does the Fair Labor Standards Act provide?
Do you know the definition of a working foreman?
Do you know what determines coverage of federal wage-hour rules?
Are your wage and salary records adequate?

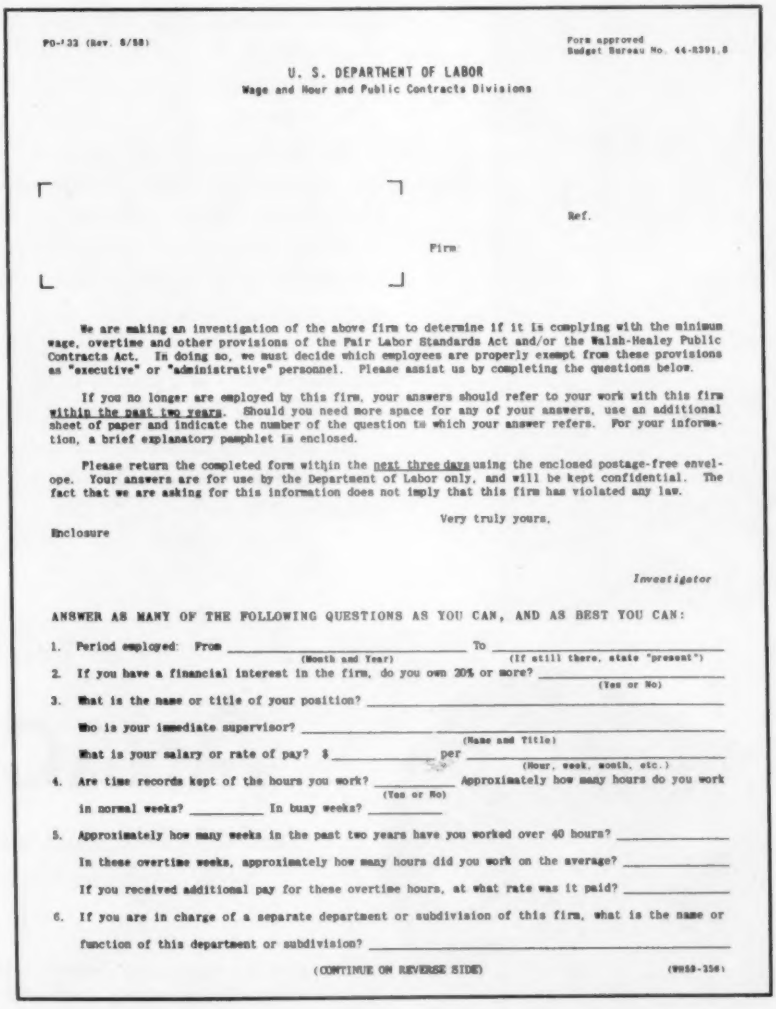
By ROBLEY D. STEVENS*

LOOK around your organization. Right now, can you account for your personnel costs? One discovery that you as an employer in the nonmetallic minerals industry can make is that overpayments, as well as underpayments, in the compensation of your personnel could be a source of grievances and even unnecessary governmental investigation. And yet, your company may be paying a larger personnel bill than is actually necessary because you may be erroneously classifying personnel who can qualify for the exemption status.

Exemptions From Fair Labor Standards Act According to the Fair Labor Standards Act, anyone in your company covered by this law must be paid overtime for work in excess of 40 hours per week. A good question to ask and answer is: *Who is exempted and who is not?* You can settle the question if you compare the job activities of each employee in your company with the test of salary, duties, and basic requirements of eligibility for exemption. You will find classifications of personnel exemptions listed on page 132, about which you should know all that you possibly can.

Keep in mind, however, that the purpose of the exclusionary language—placing a limitation on the amount of nonexempt work—means distinguishing the *bona fide* executive from the working foreman who regularly performs work only remotely related to the supervisory functions.

Working Foreman Here's how to define a working foreman: he is one who spends a substantial amount of his time in work which, although not performed by



PO-732 (Rev. 8/58) Form approved Budget Bureau No. 44-R391.8

U. S. DEPARTMENT OF LABOR
Wage and Hour and Public Contracts Divisions

Ref.

Firm

We are making an investigation of the above firm to determine if it is complying with the minimum wage, overtime and other provisions of the Fair Labor Standards Act and/or the Walsh-Healey Public Contracts Act. In doing so, we must decide which employees are properly exempt from these provisions as "executive" or "administrative" personnel. Please assist us by completing the questions below.

If you no longer are employed by this firm, your answers should refer to your work with this firm within the past two years. Should you need more space for any of your answers, use an additional sheet of paper and indicate the number of the question to which your answer refers. For your information, a brief explanatory pamphlet is enclosed.

Please return the completed form within the next three days using the enclosed postage-free envelope. Your answers are for use by the Department of Labor only, and will be kept confidential. The fact that we are asking for this information does not imply that this firm has violated any law.

Very truly yours,

Enclosure

Investigator

ANSWER AS MANY OF THE FOLLOWING QUESTIONS AS YOU CAN, AND AS BEST YOU CAN:

1. Period employed: From _____ (Month and Year) To _____ (If still there, state "present")
2. If you have a financial interest in the firm, do you own 20% or more? _____ (Yes or No)
3. What is the name or title of your position? _____
   Who is your immediate supervisor? _____ (Name and Title)
   What is your salary or rate of pay? $_____ per _____ (Hour, week, month, etc.)
4. Are time records kept of the hours you work? _____ (Yes or No) Approximately how many hours do you work in normal weeks? _____ In busy weeks? _____
5. Approximately how many weeks in the past two years have you worked over 40 hours? _____
   In these overtime weeks, approximately how many hours did you work on the average? _____
   If you received additional pay for these overtime hours, at what rate was it paid? _____
6. If you are in charge of a separate department or subdivision of this firm, what is the name or function of this department or subdivision? _____

(CONTINUE ON REVERSE SIDE) (W850-356)

*Business writer and former federal wage-hour inspector.

his subordinates, consists of ordinary or other routine, recurrent, repetitive tasks which are a regular part of the job.

If an employee in your plant holds a dual job, he may be, for instance, a foreman-production worker, a supervisor-clerk, or an employee with some other skilled or unskilled occupation. Thus, his nonsupervisory duties may be unrelated to anything that he must do to supervise employees under him or to manage a department.

Plant employees in dual jobs which may involve a substantial amount of nonexempt work can perform one or more of the production or operating functions; foremen who have as a regular part of their duties the adjustment, repair, or maintenance of plant machinery or equipment; foreman who perform clerical work other than the keeping of time and production records of their employees.

Also classed as dual jobs are those of the foreman of a shipping room, who makes out the bills of lading and other shipping records; the warehouse foreman, who also acts as inventory clerk; the head shipper, who also has charge of a stockroom, who assists in placing products on shelves and keeps a perpetual inventory record; the head bookkeeper; and the chief clerk.

Executive, Administrative Worker

If you are an officer-manager and you do not supervise two or more other employees, you may not qualify for exemption as an executive employee; but possibly you may qualify for exemption as an administrative worker.

An employee in your plant charged with the execution of your company's credit policy, management of traffic, or purchasing, or other responsible office work, uses regular exercise of discretion and judgment while doing clearly exempt work.

Worker's Duties Must Meet All Tests

It must be understood, of course, that the federal wage-hour rules do not exempt all employees in your plant, nor all employees in any particular occupation. To have the exemption apply, *the individual's duties should meet all tests laid down.*

Your plant employees may work any number of hours weekly, so long as they are paid overtime beyond 40 hours weekly—unless, of course, they qualify for the exemption status. In that case, there is no overtime problem.

Employees in your plant who receive a higher rate than the statutory minimum should be paid at a higher rate on the basis of time and one-half that rate. The term "regular rate" is defined as including all remuneration for employment paid your employees, except payments specifically excluded, as provided for by the so-called statutory exclusions.

Under the federal wage-hour regulations, you are not required to pay these salaries to employees because the salary tests are for exemption purposes. However, if an employee in your plant does not meet the salary tests, as well as the duties and responsibilities tests, he may not qualify for the exemption. In such case, you may, of course, continue to pay him on the basis of a salary; but the minimum wage and overtime pay requirements should be met, unless some other statutory exemption applies.

In addition, these requirements apply only to your plant employees who are engaged in interstate commerce or in the production of goods for interstate commerce, including any closely related process or occupation directly essential to such production.

Records Must Be Kept

You are required, as an operator, to maintain certain time and payroll records, but no particular form or order is necessary. Based on past experience, the following accounting records should be kept for inspectional purposes:

Name of employee, home address, social security number, occupation, time and day workweek begins, total hours worked weekly, basis on which wages are paid, legal deductions, total wages paid each pay period, and date of payment including pay period covered by the payment.

If a foreman is on a fixed work-

This form is filled out by the employee and/or an inspector when he is determining the exemption status of an employee.

7. Do you supervise the work of other employees? _____ (Yes or No) If so, how many employees do you supervise? _____ If you perform any work of the same type as that performed by those under your supervision, estimate the number of hours so spent in a normal workweek. _____

8. Do you hire, fire or promote other employees or make recommendations as to such actions? _____ (Yes or No)

9. What important decisions do you make that affect the work, management or policies of this firm, or your department or subdivision? _____

10. Starting with what you consider to be your primary or most important duty, name the principal tasks or duties you perform (including any manual labor or routine clerical work) and estimate the time you spend in each during a normal workweek:

Please sign here _____ Date _____ Home phone no. _____

Address _____ Date of birth _____
(Number, Street, City, Zone, State) (If under 21)

ing schedule, you should keep a record showing the exact schedule of daily and weekly work hours that he is expected to follow.

Keep all records for three years, and hold payroll date on which wage-hour computations are based for two years. The latter items include time cards, wage-rate tables, working schedules, order, and billing and shipping information. An investigator may request your plant to make extensions, recomputations, or transcriptions.

In every plant, personnel costs are often the largest single component of the cost of doing business. Thus, the control of these personnel costs is one of the most important parts of your management plan for economical production. You must keep records to show the results of the dollars spent for personnel, so that intelligent decisions may be made in the area of production and selling policies.

You can see, therefore, that while personnel cost is expensive enough without making it more so because of an erroneous classification of your supervisory personnel, the objectives of accounting for your employees may be thus summarized:

1. To assign personnel costs to specific jobs, processes, or activities, in order to provide a basis for the direction of production and selling policy.

2. To provide for accurate and prompt payments to employees.

3. To fulfill wage-hour reporting requirements and provide a basis for the preparation of your accounting reports.

The first step in reducing plant personnel costs is to determine what they are at present; then management has a standard to operate against. These pointers should help you control personnel costs.

Every employer should know what to consider in determining which employees qualify for the supervisory exemption status.

CHECK YOUR EXEMPTION STATUS
HOW DO YOU RATE?
ANSWER EACH QUESTION YOURSELF

YOU ARE A PLANT EXECUTIVE IF—	YES	NO
1. Your primary job is the management of your company or of a recognized department	☐	☐
2. You regularly direct the work of two full-time employees	☐	☐
3. You may hire or fire, or recommend hiring or firing, or if your recommendations in regard to hiring or firing are given special weight	☐	☐
4. You exercise regular discretionary powers	☐	☐
5. You spend no more than 20% of your workweek in nonexempt work	☐	☐
6. Your salary is at least $80 per week	☐	☐

YOU ARE A PLANT ADMINISTRATIVE WORKER IF—		
1. Your primary job is responsible office or nonmanual field work of substantial importance to the management or operation of your plant	☐	☐
2. You customarily and regularly exercise discretion and independent judgment, as distinguished from using skills and following procedures	☐	☐
3. You must have the power to make important decisions	☐	☐
4. You spend no more than 20% of your workweek on nonexempt work—meaning work not closely related to your administrative functions	☐	☐
5. You earn at least $95 per week	☐	☐

These classifications will indicate which employees are exempted from overtime provisions of the Fair Labor Standards Act.

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Gypsum Lime & Alabastine To Have New Board Plant

Construction is under way on a multimillion-dollar expansion of board manufacturing facilities of Gypsum, Lime & Alabastine Limited at Caledonia, Ont., Canada.

A complete new board plant is being erected to boost G.L.A.'s gyproc lath, wallboard, and sheeting manufacturing capacity by 70 percent. The enlarged installation is scheduled to be completed next spring.

The $3,000,000 plant of American Gypsum Company, five miles north of Albuquerque, N. M., went into production during September. Daily average production will equal 400,000 sq. ft. of gypsum board products.

Mines Bureau Projects On Nonrefractory Clay To Explore Aggregate Uses

Nonrefractory shales and clays will be studied in the laboratory and in the field by the U. S. Bureau of Mines during the present fiscal year, which began on July 1.

According to the Bureau sources, although 80 plants in the nation now produce lightweight aggregate, local shortages exist, and exploration and evaluation of clays and shales suitable for lightweight aggregate will continue. Furthermore, the use of such materials is expected to increase.

In co-operation with mineral development agencies of various states, the Bureau will evaluate clay deposits for possible use in lightweight aggregate, whiteware, enamel, and catalysts, and also as mineral fillers and bleaching agents. Simultaneously, the Bureau will survey the supply, demand, and marketing potential of blasting clays and shales, bentonite, and fuller's earth in the southeastern states.

In the laboratory, Bureau researchers are making fine-grinding tests on certain kaolins and will attempt to develop a special machine for continuous ultra-fine grinding of kaolin and similar soft materials.

Other clay-resource work will include beneficiation of halloysitic clays of the Pacific Northwest to improve their usefulness in ceramics.

Stations at Norris, Tenn., Minneapolis, Minn., Tuscaloosa, Ala., Bartlesville, Okla., San Francisco, Calif., and Albany, Oreg., will be involved in the Bureau's clay projects.

National Bureau of Standards Issues Standardization Manual

Publication of the National Bureau of Standards Miscellaneous Publication 230, titled *Standardization Activities in the United States—A Descriptive Directory,* has been announced. The 210-page volume, written by Sherman F. Booth, provides a descriptive inventory of the work and objectives of organizations involved in standardization activities.

Standardization is widely regarded as the basis of modern industry. Achievements in technology—particularly in mass production and automation—can be traced partly to the standards and good measurement practices established and disseminated by the many groups concerned with standardization. This volume lists the organizations alphabetically and gives brief descriptions of their standardization areas and accomplishments.

The book may be ordered from the Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, $1.75 per copy. (Foreign remittances must be in U. S. exchange and should include an additional one-fourth of the publication price to cover mailing costs.)

Flash!

The Russians have claimed another first: the development of the first jet earth-digging machine, which has a reported capacity of 4,000 t.p.h. The claim states (but doesn't say how—Ed.) that the blast from a jet engine is used not only to remove rock to a depth of 6 ft. in a 6-ft. swath, but to toss the rock a distance of 100 ft.

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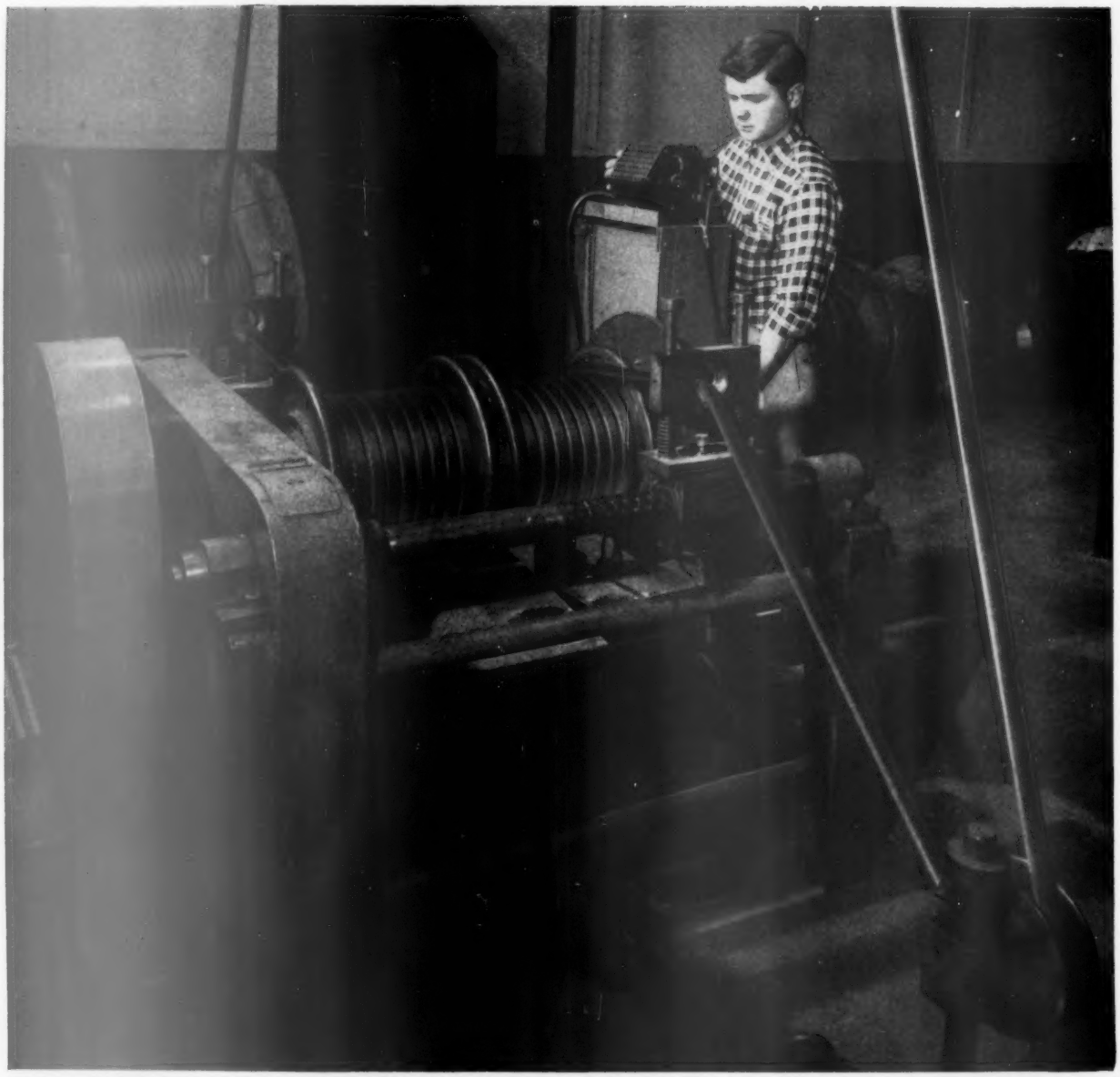

Accelerated testing of cable. This machine, designed by **AS&W engineers, is testing** mining machine cable to determine its resistance to reeling and pay off under tension, abrasion, flexing under tension, kinking under tension. **Just one of the ways** to determine the best insulating and jacketing compounds.

From portable tools to the largest power shovels, Amerclad Cables offer safe dependable service.

It's how you mix ingredients in just the right proportions that makes a big difference in cable performance.

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- Special Purpose Wire & Cable
- Aerial, Underground and Submarine Cable

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Each conductor is separately insulated with Amerite, a tough heat-resisting, special rubber compound that exceeds the requirements of ASTM, and other industry standards. A rugged abrasion resisting Amerprene jacket protects the cable from mechanical abuse.

Tiger Brand Amerclad Cables are as tough as they come. They soak up shock and vibration, withstand crushing impact, severe jerking and pulling for unbelievably long periods. Used outdoors for mining, quarrying and excavating machines, Amerclad resists the constant wear and abuse from contact with rocky ground. And installed on lighter indoor equipment—electric welders, shop tools and motor leads—Amerclad gives top performance even when it's dragged over rough floors, through oil, grease or water.

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Questions and Answers On New Tax Reporting

By PAUL LOCKWOOD

TAX abuses in entertainment and employee expense account reporting have continued, despite the recent crackdown of the Internal Revenue Service.

Therefore, the Commissioner of Internal Revenue is asking for more detailed reporting on income tax returns, beginning with 1960. Employee returns will be the same, but *employers* will be required to submit more detailed reports. The following points on employer reporting of employees' expenses may clarify a few important issues.

QUESTION: *Does the regulation cover all types of business organizations?*
ANSWER: Yes. The regulation applies to all employers such as corporations, partnerships, and sole proprietors. However, the details vary with the form of organization.

QUESTION: *What are corporations required to do?*
ANSWER: On Schedule E of Form 1120 for corporations, the section "Compensation of Officers" is being expanded. In addition to the payments designated as compensation, all expense account allowances paid to or on behalf of the officers must be reported.

QUESTION: *Does this expense reporting apply to all officers of the corporation?*
ANSWER: Yes. The information will be required of all corporate officers. However, if there are more than 25 officers, it applies only to the 25 highest-paid officers. The highest-paid officers are determined by the total of their compensation, plus expense account allowances.

QUESTION: *What are partnerships required to do in this new reporting procedure?*
ANSWER: Form 1065 for Partnerships will be expanded, similarly to the expansion of the corporation form. It will require similar information to be reported about all partners, including limited partners of the firm.

QUESTION: *What are sole proprietorships required to do under the provisions of this new reporting?*
ANSWER: Schedule C of Form 1040 for Individual Proprietorships will require similar information. This reporting covers the owner of the business and his five highest paid employees, based on the total compensation, plus expense account allowances.

QUESTION: *Are there any exemptions to this rule for small firms?*
ANSWER: Yes. This detailed reporting is not required for employees who receive less than $10,000 including compensation and expense account allowances paid to or on behalf of them in one taxable year.

A new detailed report on income tax returns for taxable years beginning after December 31, 1959, must be filed by both corporate and noncorporate taxpayers.

QUESTION: *What does "expense account allowances" mean in this regulation?*
ANSWER: Basically, it covers two areas of payment by the tax reporting firm:

1. Money received as advances or reimbursement other than regular compensation.
2. Money paid by the firm for expenses incurred by or on behalf of an officer, partner, employee, or owner. This includes all amounts charged through any type of credit card.

QUESTION: *Will there be any other new information required by this new regulation?*
ANSWER: Yes. You will be required to report if you claimed a deduction for:

1. Recreation facilities including a hunting lodge, ranch, farm, fishing camp, or resort property.
2. Accommodations, such as a hotel room or suite, apartment, or house, for customers, officers, or employees (including family members).
3. Convention or business meeting expenses of family members of officers or employees.
4. Vacations for officers or employees or members of their families, but not vacation pay reported on Form W-2.
5. Boat or yacht for entertainment of customers for personal use of officers, employees, or their families.

(Concluded on page 138)

Survey Reveals

How Credit Is Used To Protect and Build Profits

ONE out of every four American companies gets 20 percent or more of its business from "marginal" accounts—and no company claims it gets its entire sales volume from foolproof credit risks. This is one of the key findings in a new survey made by the National Association of Credit Management for *Management Methods* magazine. The complete survey results appear in the September issue of the magazine in an article entitled *How Companies Now Use Credit to Protect — and Build — Profits.*

Every 60th credit executive among the total 35,400 N.A.C.M. members was polled for his views and experience with current credit problems and practices. A 22 percent response of usable replies was received. The survey results point up (1) what credit problems companies face now; (2) what role presidents and other top managers play in credit policies; (3) how credit can be used to build sales; and (4) what new credit practices are now being tried.

The survey is published in question-and-answer form. Here are some of the major findings:

Credit and Customers

Query—Are you collecting receivables more slowly, faster, or at about the same rate as a year ago?

Answer

More slowly	37%
Faster	16
Same rate	47

Query—In your opinion, will collection problems increase, ease up, or stay about the same through the next 12 months?

Answer

Increase	52%
Ease up	12
Stay the same	36

Conclusion—More than one-third of the credit managers surveyed report that collecting money in 1960 is tougher than it was a year ago. More than half of these men expect the collection problem to increase during the next 12 months.

Query—What percentage of your total annual credit sales would you estimate comes from "marginal" accounts?

Answer

Percentage of Business from Marginal Accounts	Estimated by This % of Credit Managers
26% or more	13%
21 to 25%	12
16 to 20	20
11 to 15	13
6 to 10	22
1 to 5	20
None	0

Conclusion—One out of every four companies surveyed says that 1/5 of more of its business comes from "marginal" accounts. One out of every three companies claims that 11 to 20 percent of its business comes from risky customers. It is significant that not a single company reports getting its total sales volume from foolproof credit risks.

What is a "marginal" account? A composite answer, based on 123 definitions given by credit managers, indicates that a marginal account has at least four fundamental characteristics: (1) strong sales potential, (2) responsible management, (3) a record of slow payments, and (4) inadequate working capital.

Credit and Top Management

Query—Does your company president participate in the formulation of major credit policies?

Answer

Always	32%
Frequently	14
Sometimes	39
Never	15

Conclusion—In at least 85 percent of American companies, the company president participates in major credit decisions and policies.

Query—In your opinion, how much authority does the sales manager exercise in determining your credit policy?

Answer

Considerable	29%
Some	29
Slight	26
None	16

Conclusion—In only one out of six companies does the sales manager exercise no authority whatever over credit policies.

Another question reveals that credit terms, according to substantially more than one half of the credit executives surveyed, are a matter of independent, internal decisions. However, general economic conditions are the major factor in setting up credit terms for about 19 percent of the companies—and competitors' terms for about 17 percent of the companies.

Credit and Sales

Query—Do you foresee a trend for companies to charge interest on overdue receivables?

Answer

Yes	60%
No	40

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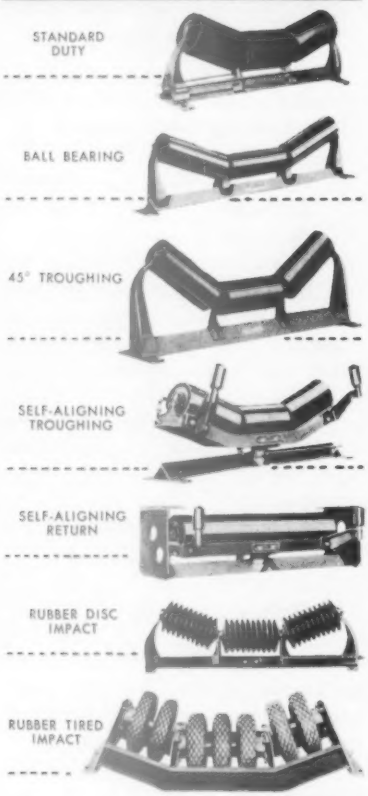

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Query — Do you believe that American business should initiate "revolving" or similar special credit plans for commercial credit?

Answer	
No	53%
Yes	21
No opinion	26

Query — In credit appraisal, to which one of the following traditional "C" 's of credit (character, capacity, capital, conditions) do you personally give the most weight?

Answer	Ranked first by
Character	53%
Capital	26
Capacity	12
Conditions	1
Other answers	8

Other findings from the series of questions probing the credit executive's contribution to building company sales:

Nearly seven out of 10 credit managers take active steps to help their companies build sales. They directly solicit additional business from desirable accounts by personal call, telephone, and mail, in the course of normal credit relations. Sending direct mail stuffers with bills is a frequent practice, and dormant customers may be advised that their credit is good and urged to use it.

Two out of every ten credit executives say that they spend more than one-fourth of their working time on cultivating customer goodwill. About three out of 10 spend anywhere from 11 to 25 percent of their time doing so, and the rest—about half of the group—spend up to 10 percent of their time trying to keep their customers happy.

The published survey contains answers—and quoted comments—to many other questions, such as the following:

Do credit managers believe that it is possible to predict a customer's future stability and liquidity by analysis of financial and other credit file information?

How does management measure the effectiveness of the credit department?

What data does the credit manager give top management to help it interpret business and economic trends and define long-range company objectives?

Is cash forecasting done, and how far ahead?

The surveyed companies represent a cross section of American business. Manufacturers accounted for 32 percent of the sample and wholesalers, 37 percent. The rest were jobbers service industries, and a few banks and other financial institutions. The companies ranged in annual sales volume from $36,500 to $1.5 billion.

Tax Reporting

(*Concluded from page 136.*)

QUESTION: *How much detail is necessary on reporting these expenses?*

ANSWER: The reporting on the employer's income tax return will show a dollar amount for employees.

However, according to Revenue Ruling 59-396, the employee must be required to submit written statements to the employer. These statements must show the "business nature and the amount of expense incurred, broken down into broad categories, such as transportation, meals, and lodging while away from home overnight, and other business expenses."

QUESTION: *May a per diem expense allowance be used?*

ANSWER: On the new reporting section, you do not detail the basis for allowances. However, you will save time and trouble for yourself and your employees when you adopt a *per diem* and mileage allowance.

If your *per diem* allowance is no more than $15 a day and your mileage allowance is no more than 12½ cents per mile, your employees do not need to account for this on their income tax return.

QUESTION: *Is it absolutely necessary to complete the new sections on expense accounts on the income tax return?*

ANSWER: There is no penalty for failure to complete this section. However, it is fairly obvious that since the Internal Revenue Service is using this approach to stop abuses, they will check it. Failure to complete the section will probably lead to a more thorough examination of your income tax return.

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Increase Reported in Injury Rate During 1959 in American Industry

PRELIMINARY injury and employment data compiled by the Bureau of Mines, U. S. Department of the Interior, indicate that the frequency of injuries in relation to production, development, and related workers in the mineral-extractive industries in 1959 declined nearly 5 percent below the 1958 total. But on the other hand, sand and gravel, cement, limestone, and slag indicated slight increases in injury rates although the over-all labor force was smaller.

Six of the 12 groups in the report indicated a reduction in combined fatal and nonfatal injuries in 1959 over 1958. These industries indicating declines are: coal mining, petroleum and natural gas, metal mining, stone quarrying, metallic ore dressing, and nonferrous reduction plants and refineries.

The remaining six groups reported higher accident frequency rates for 1959. These industries included sand and gravel, slag (iron blast-furnace), coke, peat, nonmetal mines, and nonmetal mills.

The sand and gravel portion of the survey includes establishments primarily engaged in the production of sand and gravel. Both stationary and portable plants are included in the canvass. In 1958 the survey covered 6,333 operating units, as compared with 5,174 for 1959.

The total number of men employed in the production of sand and gravel (excluding office workers) was 43,597, a decline from the 1958 total of 51,122. Although fewer men were employed, total injuries for 1959 indicated a frequency of 20.33 injuries for every 1,000,000 man-hours worked. The frequency of nonfatal injuries in 1959—20.08—increased over the 1958 figure of 18.37. Fatal injuries dropped in 1959 to .25. Nonfatal injuries in 1958 were .27 for every 1,000,000 man-hours worked. Total man-hours worked in 1959 stood at 80,770,000, a decline from the 1958 total of 92,456,000.

The stone quarrying section of the survey includes categories for cement and limestone production. The total number of men employed in the production of cement in 1959 was 25,691. This was a decrease from the 1958 figure of 29,908. The number of operating units reporting for 1959 was 156, whereas the 1958 report covered 201 units.

The frequency of injuries per 1,000,000 man-hours worked in the cement segment of the report indicated a total of 4.32 in 1958 and 4.93 in 1959. Fatal injuries, however, dropped from .13 in 1958 to .09 in 1959. Nonfatal accidents increased from 4.19 to 4.84.

The limestone segment of the survey indicates that the total number of men employed in 1959 declined from the 1958 total of 29,649 to 25,921 in 1959. The frequency of injuries per 1,000,000 man-hours worked decreased from 36.46 in 1958 to 29.70 in 1959. On the other hand, fatal injuries rose from .45 in 1958 to .64 in 1959. Nonfatal injuries also showed a decrease from 36.01 in 1958 to 29.05 in 1959. The report covered 1,818 operating units in 1958, and 1,523 in 1959.

The slag industry, as defined in the report, includes establishments processing the nonmetallic product commonly referred to as slag, resulting from the reduction of blast-furnace iron.

The canvass covered 70 slag production units in 1958 and 71 in 1959. In 1958 a total of 1,882 production, development, and related workers were employed in this industry. This labor force decreased to 1,789 in 1959. Although fewer men were employed, the injury frequency rate increased from a total of 11.65 in 1958 to 11.95 in 1959. Fatal injuries also increased slightly from .26 in 1958 to .27 in 1959. Nonfatal injuries also increased from 11.39 to 11.68.

Injury Frequency Rates, Excerpted from U.S. Bureau of Mines Data

Industry	Production, Development, and Related Workers					
	1958			1959		
	Total injuries	Fatal	Nonfatal	Total injuries	Fatal	Nonfatal
Nonmetal mining:						
Clay and fuller's earth	35.36	.65	34.71	30.11	.46	29.65
Feldspar-mica-quartz	21.40	.79	20.61	46.72	—	46.72
Fluorspar	43.66	.81	42.85	(1)	(1)	(1)
Gypsum	8.16	.35	7.81	11.09	.38	10.70
Phosphate rock	11.32	—	11.32	12.15	.23	11.92
Potash	44.05	.52	43.52	43.76	—	43.76
Salt	27.84	.74	27.10	32.64	.41	32.23
Sulphur	17.65	—	17.65	24.11	—	24.11
Nonmetal, mining, NEC (2)	38.11	.50	37.61	39.57	.69	38.88
Nonmetal mills	21.06	.13	20.94	24.37	.13	24.24
Sand and gravel	18.64	.27	18.37	20.33	.25	20.08
Slag (iron blast-furnace)	11.65	.26	11.39	11.95	.27	11.68
Stone quarrying:						
Cement	4.32	.13	4.19	4.93	.09	4.84
Granite	48.80	.27	48.53	38.98	.13	38.85
Limestone	35.25	.40	34.85	32.52	.48	32.04
Limestone (chief product lime)	21.89	.06	21.83	17.69	.49	17.20
Marble	35.69	.16	35.53	41.37	—	41.37
Sandstone	46.87	.17	46.70	40.67	.37	40.30
Slate	43.91	—	43.91	54.29	.35	53.94
Trap rock	44.36	.79	43.57	50.12	.35	49.78
Miscellaneous stone	53.22	—	53.22	48.76	.89	47.87

NOTES: (1) Included in nonmetallic minerals, not otherwise classified.
(2) Includes abrasives (1959), asbestos, asphalt, barite, fluorspar (1959), magnesite, pumice, talc and soapstone, and minor nonmetals.

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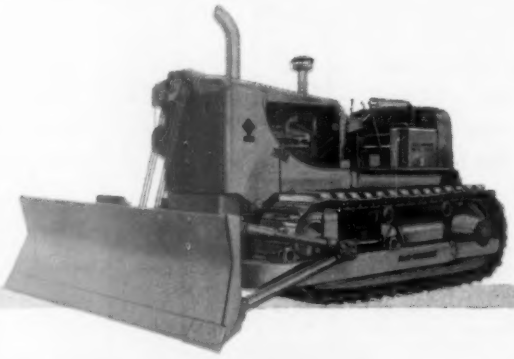

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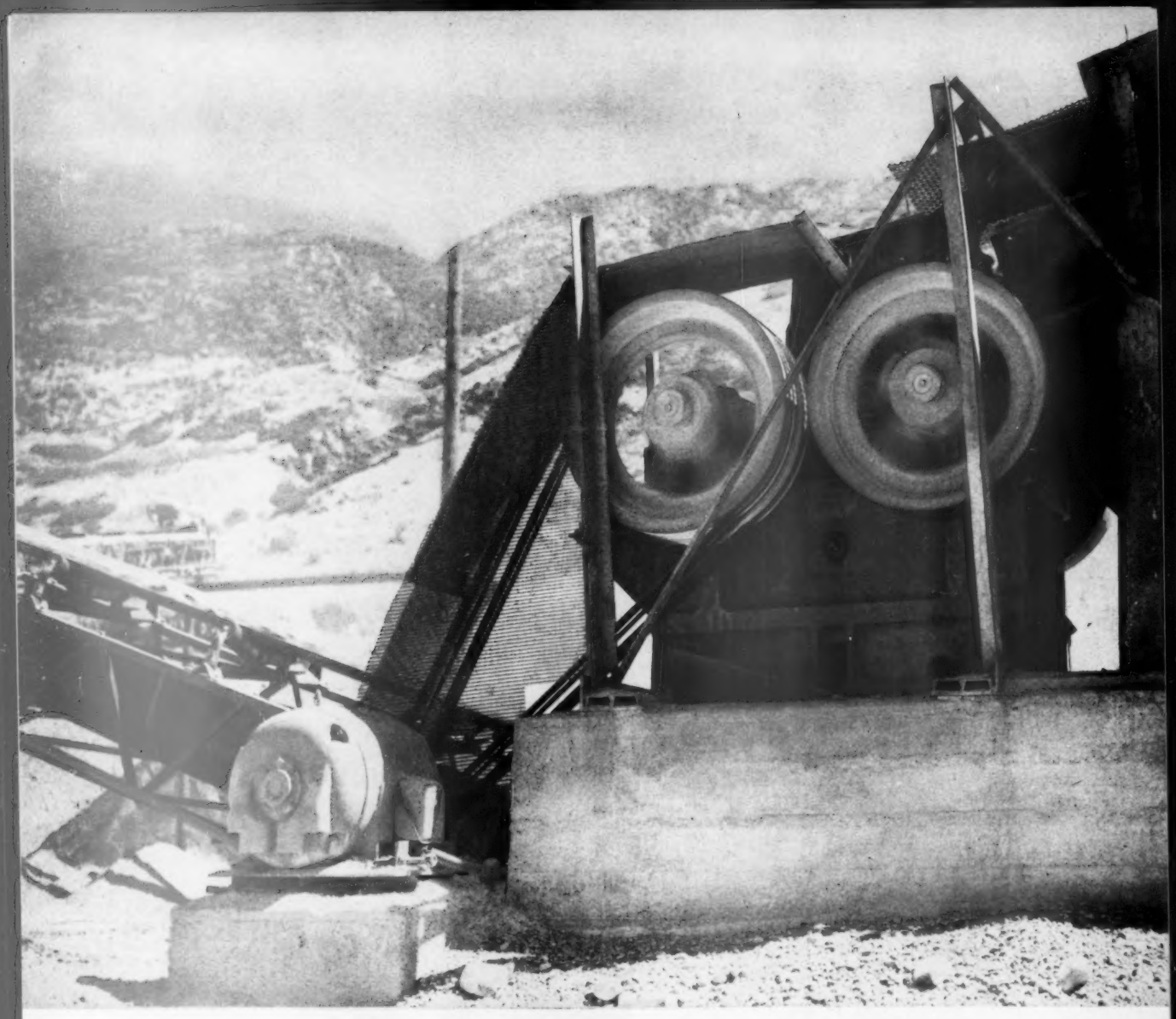


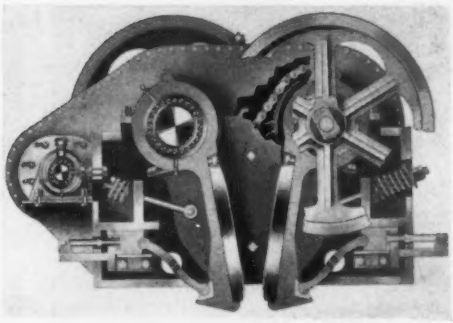
YOU'RE MONEY AHEAD with every job-proved, high capacity crusher in the

Single Jaw Crushers available in a complete range of 13 sizes, ranging from the big-producing 42″ x 48″ to the 10″ x 16″ size in the roller bearing type. Plain bearing single jaw crushers range from 9″ x 16″ to 10″ x 36″. Three sizes of Twin Jaw Crushers, from 12″ x 16″ to 18″ x 36″, available for stationary installations or in portable plants. Low maintenance cuts costs.

Six models of Double Impeller Impact Breakers include sizes from 22″ x 22″ to 53″ x 60″ to meet volume requirements up to 1000 tons per hour. *Counter*-rotating impellers, an exclusive Cedarapids design, permit breaking rock with rock to utilize the entire breaking chamber, thus saving manganese wear and reducing maintenance. Two sizes of Single Impeller Impact Breakers also available for intermediate reduction to increase plant capacity.

Exclusive Cedarapids Hammermill features give the material a combined impact breaking and milling action that produces big volumes of uniform cubical shaped aggregate without slabs or slivers, as well as high quality ag-lime, and turn out more tons per hour than other similar types of equipment. Four sizes, from 20″ x 33″ to 50″ x 40″.

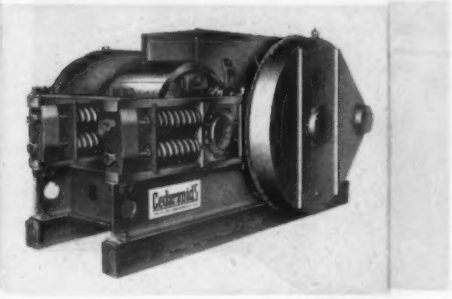
Extra Output . . . Extra Profits . . . for 14 years with CEDARAPIDS TWIN JAW CRUSHERS



DESIGNED WITH THE SAME CEDARAPIDS JAW CRUSHER FEATURES THAT SET THE STANDARD FOR THE INDUSTRY

- Eccentric shaft extra heavy to absorb strain and minimize shaft flexure
- Adjustable-tension timing chain drive prevents trouble due to possible shaft flexure. No fine-cut timing gear that requires critical alignment
- Heavier-than-average self-aligning pitman and side bearings absorb side thrust
- Reinforced, electric-welded crusher bases are completely stress-relieved for longer life
- Extra heavy flywheels insure smooth operation under surge feeding with minimum power

Complete Cedarapids Line



Where high capacities of small sized aggregates are required, Cedarapids Roll Crushers are the best units for secondary reduction. Material is dropped between the rolls to penetrate deep into the crushing area and permit faster feeding. Special feed box with angle divider spreads material across the full width of the rolls to prevent uneven wear on the roll shells. Six sizes, from 16" x 16" to 55" x 30", meet volume demands.

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The first Cedarapids Twin Jaw Crusher was built in 1946. In the 14 years since, aggregate producers have enjoyed the extra profits that come from the Twin Jaw's ability to step up primary crushing capacity 40% to 100% over single jaw units of comparable size.

In addition to tremendous hourly tonnages that increase overall plant production, owners of Cedarapids-developed Twin Jaw Crushers get these other benefits which assure lowest cost per ton:—

Versatility to handle many types of material, including hard or abrasive rock.

A greater percent of aggregate fractured in the primary operation (much of it crushed to finished size by the Twin Jaw) to reduce the circulating load and save wear on secondary crushers.

Extremely low maintenance, plus jaw life 5 to 8 times longer than with single jaw crushers, due to the Cedarapids design that minimizes abrasive rubbing under pressure.

There are dozens of other benefits, developed as a result of Cedarapids 14 years' experience in designing, building, and continually improving Cedarapids Twin Jaw Crushers to give you the trouble-free dependability and profitable performance that has been thoroughly proved in the field. It will pay you to send the coupon for full details. Or see your near-by Cedarapids Dealer. He can help you determine which type of crusher in the complete Cedarapids line will best suit your specific needs.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

Cedarapids — Built by IOWA

Gentlemen: I need higher crushing capacity with lower cost. Please send the Bulletins checked below.

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- ☐ Single Jaw Crushers
- ☐ Double Impeller Impact Breakers
- ☐ Single Impeller Impact Breakers
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Company.....

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HYDRASTROKE* FEEDER for PLANTS and QUARRIES

Exclusive HYDRAULIC OPERATION

A Reciprocating Feeder easily adapted to feed Screens, Crushers, Belts Trucks, Skips or Railroad cars.

PATENT APPLIED FOR

FEEDER DESIGNED FOR SEVERE SHOCK LOADING

ROCKER MOUNTING OR SUSPENSION
eliminates wear due to friction, needs no lubrication, takes minimum head room.

WIDE RANGE OF SIZES
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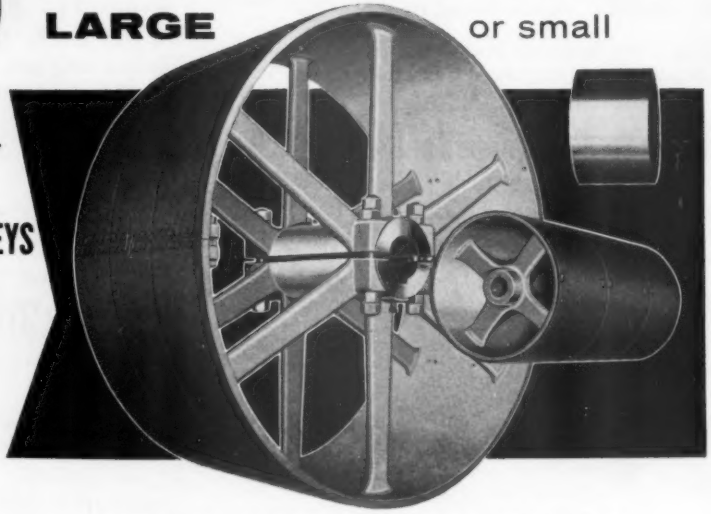
LARGE or small

EHRSAM

MICROMETAL CAST-IRON PULLEYS



There is no substitute for experience in producing cast-iron pulleys for use in our many modern industries. Today, after 88 years of experience, the Ehrsam Company is still continuing research to produce quality cast-iron pulleys.

Whether you use small pulleys or large pulleys, totally split pulleys, corrosive surface or wearing surface, you can be sure of quality gray cast-iron plus service when you specify Ehrsam Micrometal pulleys.

In quality cast-iron pulleys, experience counts and this is what Ehrsam is noted for. Call the J. B. Ehrsam and Sons Manufacturing Company and discuss your needs for standard or special pulleys.

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World's Longest Quarry Shovel Boom

This is a picture of the solution for an unusual problem—involving a 160-foot boom, the world's largest on a quarry shovel.

A "special," it typifies Marion's ability and willingness to go to unusual lengths to solve customer problems.

The machine is a Marion 5323 which carries an 11-yard dipper, 95-foot handle and 160-foot boom to deal with a rocky bank ranging up to 135 feet in height. This machine's ability to dump 326 feet away from the wall made it the ideal answer to this big quarry's problem.

Why not let Marion specialists take an imaginative look at your quarrying and mining needs?

CONSULT **MARION** MINING SPECIALISTS
for lowest costs on your property!

MARION POWER SHOVEL COMPANY • Marion, Ohio, U.S.A.

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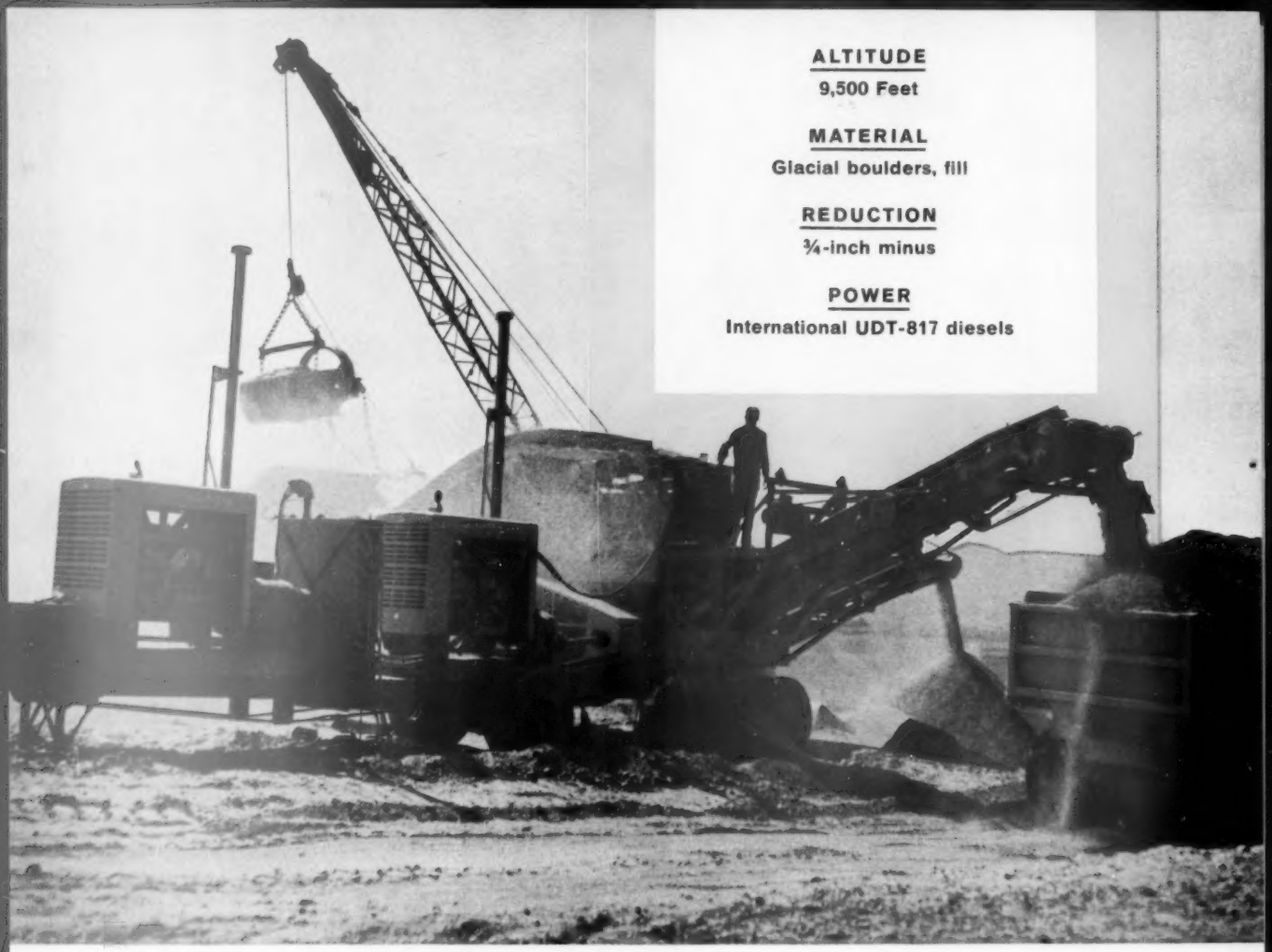

IH power keeps two draglines busy feeding 300 tons per hour to crusher...

International turbocharger efficiency keeps these rugged diesels operating at full rated power. One UDT-817 powers the Cedar Rapids crusher via direct shaft, and the other provides electric power for conveyors, screens, shakers, etc.

The plant is producing from 200 to 300 tons per hour of ¾-inch minus material, depending on pit conditions. 40% of the glacial deposit material must be crushed. C. L. Hubner Co., of Denver has the contract to supply 125,000 tons of base material, surface stone and hot mix aggregate to repave a section of Colorado 14 and U. S. 40. International power on the big capacity crusher keeps them well ahead of schedule.

Your heaviest crushing jobs can be handled easily by this rugged 385-hp UDT-817 turbocharged diesel. And there are 34 other diesel and carbureted engines in the International line—ranging up from 16.8 max. hp. Check with your International Engine Distributor or Dealer soon and find out how little it costs to power—or repower—your equipment with International.

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ENGINES

International Harvester Co.,
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A COMPLETE POWER PACKAGE

Legal Decisions

On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

RECENTLY the writer encountered this legal question: "Is it legal for a contractor to make a contract with a trucking company to haul materials for less than the freight rate established by the Public Service Commission?"

Last month a higher court definitely answered this important question in the negative. Also, this higher court held that the carrier can sue and collect the freight rate specified by the Public Service Commission, although the carrier contracted to haul the materials for considerably less than the rate authorized by the Public Service Commission.

For illustration, in *McDaniel Trucking Company v. Oak Construction Company,* 102 N. W. (2d) 575, the testimony showed these facts: The McDaniel Trucking Company is engaged in the business of hauling sand and gravel as a common carrier under a certificate issued to it by the state's Public Service Commission. The Commission issued an order which specified minimum rates to be charged by sand and gravel motor carriers.

At this time the Oak Construction Company was engaged in the construction of concrete pavement and highways requiring the use of sand and gravel. In the conduct of its business it purchased sand and gravel from a supplier and hired the trucking company to haul these materials. Soon after the Public Service Commission had specified minimum rates to be charged by all carriers who hauled sand and gravel, an official of the Oak Construction Company told an official of the McDaniel Trucking Company that he could obtain a delivered price for sand and gravel which was much lower than the combined prices being paid it to its supplier and the tariff rate that has been established by the Public Service Commission.

The result was an agreement between the parties whereby the McDaniel Trucking Company contracted to haul sand and gravel, as a common carrier, for the Oak Construction Company at the rate of 46 cents per 1,000 lb. This rate was below the Public Service Commission's rate for such service and in violation of the order of the commission.

After the trucking company had hauled sand and gravel for the construction company for several months at this low price, certain competitors complained to the Public Service Commission. The McDaniel Trucking Company then demanded payment of $15,986.70, the difference between the rate fixed by the agreement of the parties and the prescribed minimum tariff rate. The Oak Construction Company refused payment, claiming that it was not further obligated, in view of its contract with the trucking company to haul at the rate of 46 cents per 1,000 lb.

The McDaniel Trucking Company sued the Oak Construction Company to recover $15,986.70.

The lawyer for the Oak Construction Company argued that the contract for the transportation service at a rate lower than that fixed by the order of the Public Service Commission and by the carrier's tariff was illegal, that the contract was incapable of enforcement by the other party, and that for such reason the carrier was not entitled to recover. Reliance was placed on the general legal rule that the law will not aid either but will leave the parties who made an illegal con-

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With a W-C Conveyor-Scale System incorporated in your process scheme, you can have up-to-minute thru-put data at any point from incoming transfer to inventory stock-pile. This data, expressed in terms of weight per unit of time, can be totalized for inventory records, process programming, or other manufacturing and accounting functions.

W-C Conveyor-Scale Systems can be supplied for flat or trough-type belts, fixed or variable speed, in capacities from 20 to 1000 tons per hour for new or existing conveyor installations. Each is a job engineered system employing standard, unitized components. As a result, you get a "custom" system at an "off-the-shelf" cost.

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tract in the position in which they have placed themselves.

It is interesting to observe that the higher court held that the McDaniel Trucking Company can recover $15,986.70 from the Oak Construction Company, saying:

"The observance of the mandate of the statute requires that the plaintiff motor carrier charge and collect rates in accordance with the order of the Public Service Commission and the published tariff. The consignee (Oak Construction Company) could not escape the liability imposed by law through any contract with the carrier. A payment of a less sum of money than the amount of charges as fixed by the tariff would not operate to satisfy fully the indebtedness, even though the shipper and carrier intended the less payment to be full payment of the charges."

With respect to the Oak Construction Company's argument that the contract was illegal, in which the carrier agreed to transport sand and gravel at 46 cents per 1,000 lb., and that in view of its illegality the court can not enforce such a contract, the court said:

"The lawful rate is that which the carrier must exact and that which the shipper must pay. While the carrier is equally guilty with the shipper in attempting to evade the law, nevertheless the carrier may recover any balance due, in accordance with the established rates. This is to deter and discourage agreements to carry freight at less than the lawful rates. We are not dealing here with an ordinary type of contract between individuals but with a matter affecting the public generally. The claim of the defendant (shipper) that the parties must be left where they have placed themselves pursuant to the principle commonly recognized in cases involving ordinary illegal contracts may not be accepted."

Employee Not Authorized

A certain reader has asked: "If an employer authorizes an employee to accept a bid for a construction job, is the employer obligated to complete a contract on the basis of the bid the employee accepted?"

According to a late higher court decision, the answer is in the negative, unless the testimony proves conclusively that the employee was authorized to make valid contracts for his employer, as well as accept bids.

For example, in *Moser v. Kyle Corporation,* 39 N. W. (2d) 587, the testimony proved that an official of the Kyle Corporation instructed one Kartheiser, an employee, to take bids for a certain job. Kartheiser was offered $1,250 by one Moser and accepted a check from him for that amount. Within a few hours the deal was repudiated by the Kyle Corporation, and Moser's check was returned.

In subsequent litigation, it was the contention of Moser that as the Kyle Corporation had authorized Kartheiser to accept an offer or bid, the corporation was obligated on the deal made by Kartheiser.

It is interesting to observe that the higher court held the corporation not liable and said:

"There is no evidence sufficient to sustain a finding to the effect

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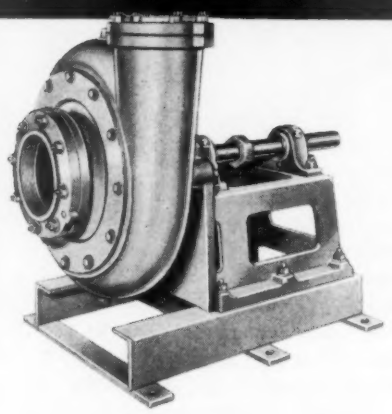

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"We drilled over 5,000 ft., averaging 15 redresses per bit, with Timken® carbide insert bits"

Special report from Rogers Construction Company

LOCATION: U. S. HWY. 30, THE DALLES, OREGON

Operating conditions:
Lava-Basalt

In converting part of U. S. 30 from a two-lane to a four-lane highway, Rogers Construction Co. of Portland, Ore., had to drill through Lava-Basalt. Holes in this very fryable rock varied from 25 to 60 feet. And for drilling on this very abrasive ground, Timken® carbide insert bits were a "natural". They set records. Some of the original 010 4½" bits have drilled well over 5,000 ft., averaging 15 redresses per bit.

Which Timken Bit should you use?

In hard, abrasive ground, the Timken carbide insert bit gives you greatest economy. But in softer ground, use the low-cost Timken all steel multi-use bit. Both bits are interchangeable in the same thread series; you can switch bits as the ground changes. What's more, dozens of different Timken bits fit the same drill steel. And both types are made from Timken electric furnace fine alloy steel, have special shoulder unions to protect against drilling impact. Let us help you select the right Timken bit for your job. Call or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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Unmatched holding power on the shaft...

New mounting simplicity.

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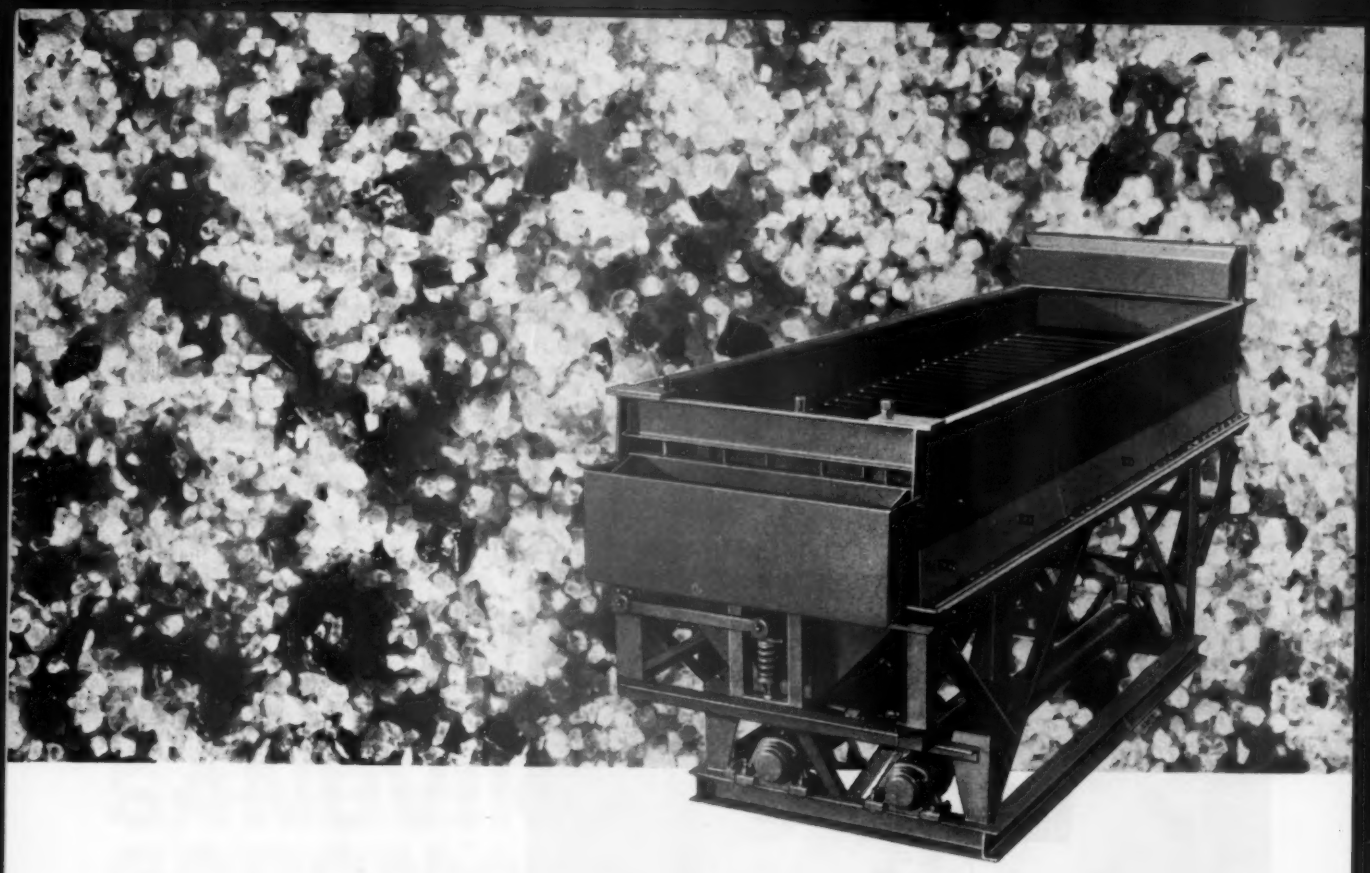

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Wemco-Remer Jigs profitably separate fine coal from sand!

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But All-Purpose Sand Company, of St. Louis, found the answer. "The Wemco-Remer Jigs *did* it!", in the words of Mr. Kenneth Wikowsky, partner and vice-president. In a plant designed by Marsh Engineering Company, and incorporating two Wemco Sand-Preps, the company now removes all lignite coarser then 1/16" and a majority of finer fractions, thus meeting specifications for concrete sand, filter sand and blasting or traction sands in the area.

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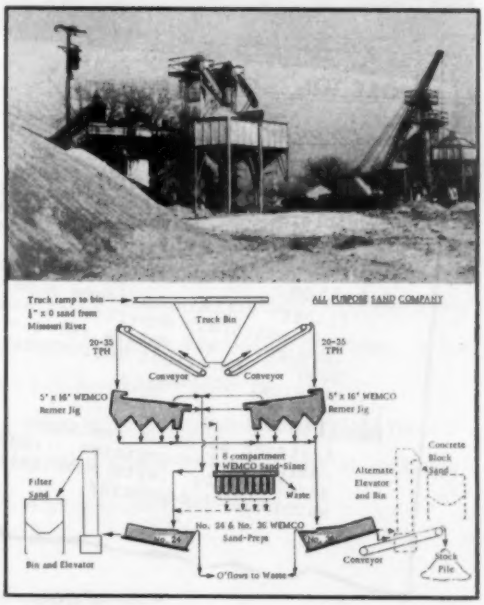

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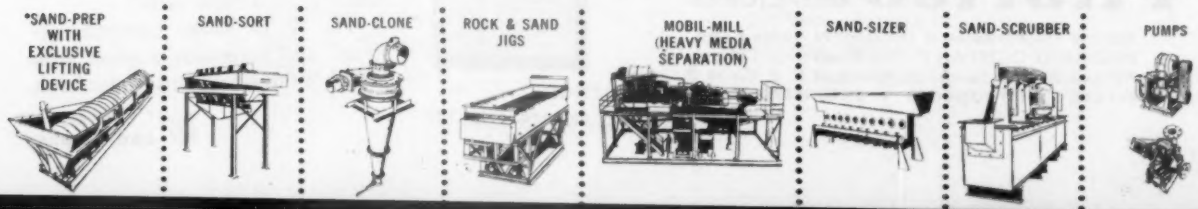


that Kartheiser had authority or apparent authority to make a sale. His authority was only to accept bids and submit the same to his superiors."

Later Moser argued that if Kartheiser exceeded his authority in accepting Moser's offer to pay $1,250, Kartheiser is personally liable.

The higher court agreed to this argument and held that a jury may hold Kartheiser personally liable to Moser, if the testimony showed that although he had no authority to complete a deal, yet his actions led Moser to believe that he had such authority.

Employee Must Be Honest

Last week I received an interesting letter from a reader, which ran as follows: "If an employee is employed by a corporation and such employee wants to make money on the side, can he go into a business without giving the corporation notice or receiving authority from the corporation? What limits an employee in using trade secrets of his employer?"

All higher courts hold that all employees are obligated and duty-bound to serve their employers faithfully, and not divulge trade secrets to a competing company. Another important point of law decided by a late higher court is that a competing company which unfairly uses a competitor's trade secrets is fully liable and must pay all its profits to the competitor whose trade secrets it utilized.

For instance, in *Holl Company v. Imperial Corporation,* 66 Atl. (2d) 319, the testimony showed that one Sander accepted employment as manager of a branch plant of the Holl Company. He was paid a salary of $7,500 a year. After working for several years for the Holl Company, Sander secretly organized a competing company, the Imperial Corporation. Sander kept in telephone communication with the latter company, but did not appear at its plant for fear of disclosing his interest in the competing company at the time he was on the Holl Company's payroll. Later Sander resigned his position with the Holl Company. The latter company sued both Sander and the Imperial Corporation, and asked the court to award it the profits earned by the latter company, and also to compel Sander to repay $15,000 in salary he had received. The higher court rendered a verdict in favor of the Holl Company, and said:

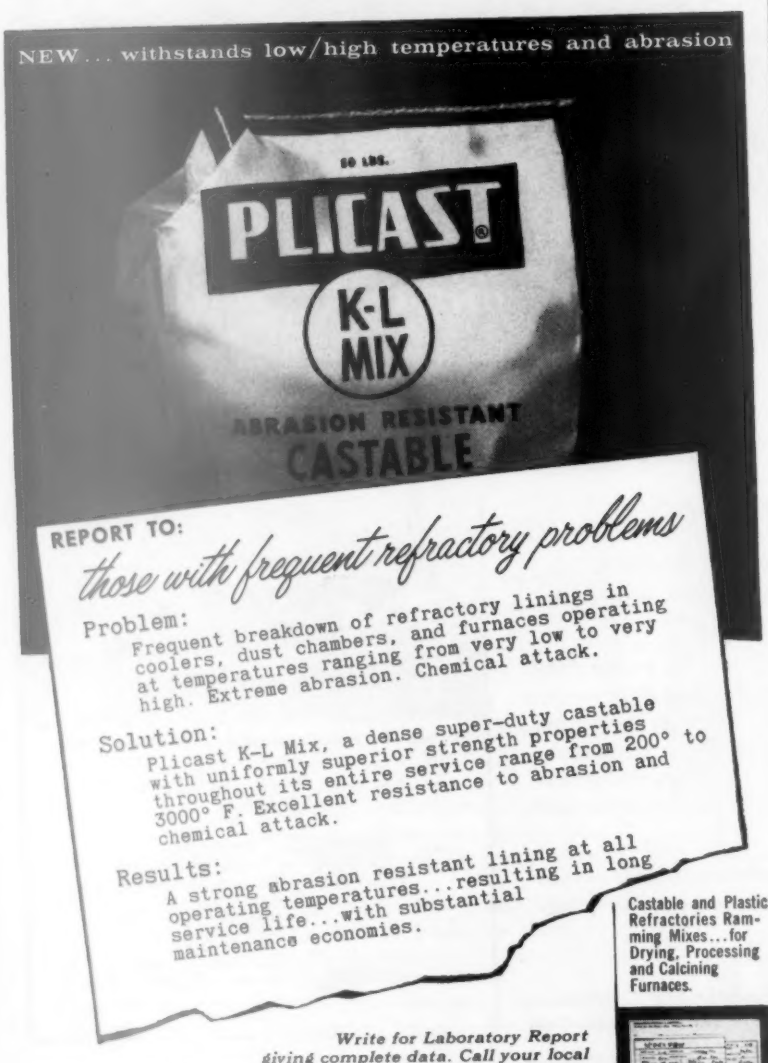
"Sander is not entitled to retain the salary paid to him amounting to $15,000."

President's Testimony Is Acceptable

Last month a higher court held that testimony given by the president of a corporation as to the quantity of concrete delivered to a purchaser or contractor is fully acceptable. Also, this court held that a seller of materials is not liable for incidental damages to a contractor resulting from breach of a contract.

For illustration, in *W. D. Miller Company v. Donald M. Drake Company,* 351 Pac. (2d) 41, the testimony proved these facts:

The W. D. Miller Company operates and maintains a plant from which it furnishes transit-mixed con-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NOW! SANDVIK COROMANT BITS

for down-the-hole drilling— available up to 9″ diameter!

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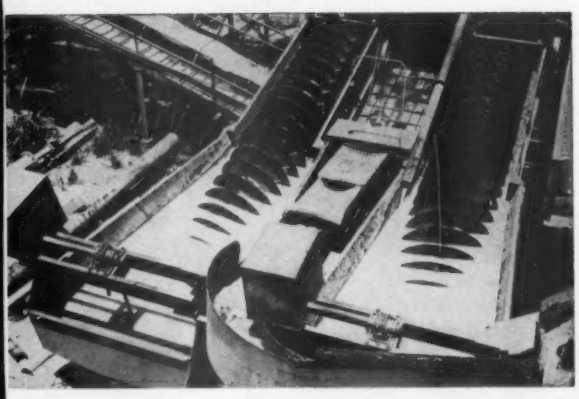
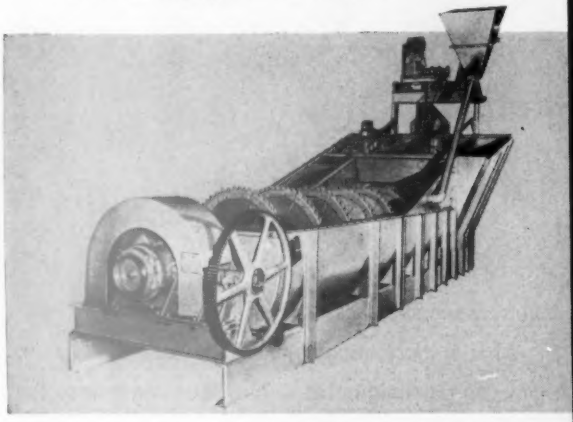
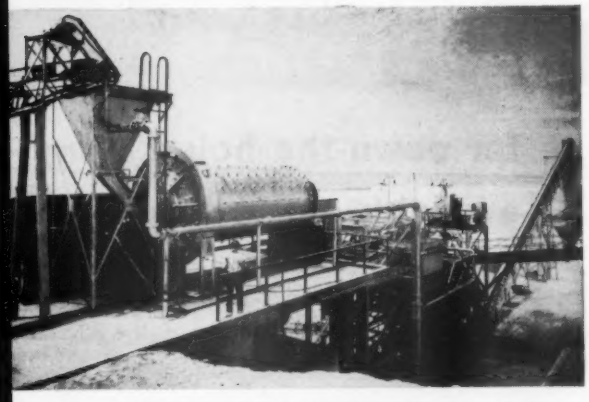


2 *Washing and Classifying with Akins Classifiers* With the Akins Classifier you can wash, deslime, dewater, and remove or save sand sizes as desired. A large *working* pool area in classifier is required to do this work...the Akins gives you more working pool area per dollar.



3 *Separating with Akins Heavy Media Separators* Many deposits can be most efficiently treated by the Akins heavy media process. The Akins' large *working* pool area permits close control of products from feed of variable quality or quantity. Reduced media recirculation in the Akins results in lower total horsepower required.



4 *Scrubbing with Marcy Heavy-Duty Scrubbers* Thorough, efficient removal of clay from sand can be accomplished with Marcy Scrubbers. The Marcy principle of small diameter, long length scrubbers gives longer retention time, more contact for scrubbing, less short-circuiting, and lower horsepower...a principle which has been proven on difficult washing of iron ore.

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crete to contractors. The Donald M. Drake Company as a contractor entered into two contracts with the United States Navy, whereby it bound itself to build several buildings at the Klamath Falls air base. Construction of the floors, foundations, and other parts of the buildings required the use of transit-mixed concrete. The W. D. Miller Company and the Donald M. Drake Company entered into a contract whereby the former agreed to deliver to the latter transit-mixed concrete of the quality specified in the contract between the Donald M. Drake Company and the Navy.

Later the Miller Company sued the contractor to recover $13,638,-92. During the trial, officials of the Miller Company testified that in the period of 15 months it supplied to the contractor transit-mixed concrete valued at $66,170.20. It alleged that $13,638.92 remained unpaid when the suit was filed.

The contractor (Drake) not only denied that it was indebted to Miller Company but submitted a counterclaim in the sum of $35,515.46, based upon averments that the concrete which the Miller Company delivered to the contractor did not meet the terms of the agreement. In other words, the contractor contended that certain concrete delivered by the Miller Company did not meet the specifications required by the United States Navy known as Bureau of Yards and Docks Specification No. 13 Yd and of another known as Federal Specification SS-A-281. Hence, the contractor argued the Miller Company breached its contract to deliver transit-mixed concrete which would meet these specifications.

The contractor stated that by reason of this breach the performance of its contracts was stopped more than a month by order of the United States Navy from September 3, and that the contractor sustained damages from this delay and from additional costs and expenses to a total amount of $35,515.46.

The president of the Miller Company conceded that the corporation delivered to the contractor during a three-day period concrete which did not meet the specifications. The president claimed that all other of its other deliveries complied faithfully with the contract and the specifications. It allowed the contractor a credit of $417.56 on account of the substandard concrete which it delivered July 27, 28, and 29. The contractor passed on the credit to the Navy, and the latter accepted it. The evidence indicates that the Navy in due time accepted the buildings and, in making payment to the contractor, deducted from the contract sum the credit of $417.56 just mentioned.

Further testimony showed that occasionally samples of the concrete which the Miller Company delivered to the contractor were submitted to Northwest Testing Laboratories, and that after this concern had subjected them to tests, the Navy and the contractor were given the results. At times the Miller Company's officials were acquainted with the results. The latter were accepted by all three and were deemed authoritative.

The president of the Miller Company testified that he went to the air base virtually every day, his company's operations are not large, and its business centers in concrete. It has only eight trucks.

In view of this testimony, the higher court held that irrespective of the fact that the contractor was prevented by the United States from doing any work on his contract for more than a month, and although he suffered considerable financial losses from this delay, the contractor could recover no damages from the Miller Company, which was entitled to recover from the contractor the sum of $13,638.92. This court said:

"Nothing has been pointed out to us which indicates that the witness was 'not qualified' . . . He was the president of his company and was, therefore, responsible for seeing to it that the ingredients demanded by the Navy specifications went into the hopper. The plaintiff (W. D. Miller Company) presented evidence which showed that in the period which began on or after July 15 and ended November 19, it delivered to the defendant (contractor) transit-mixed concrete for which it was entitled to receive under its contract with the defendant $66,170.20. The evidence showed that of that amount $13,636.92 re-

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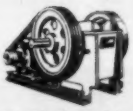
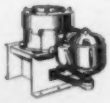


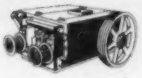
4"x 6" Massco Laboratory Jaw Crusher

Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.



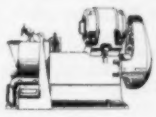
6" and 10" Massco Gy-Roll Reduction Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.



Laboratory Crushing Rolls

Sizes (Diameter x width): 8"x 4", 10"x 6", 10"x 8", 12"x 10" and 12" x 12". Adjustable roll space setting up to ¾". Double V-belt drive. Heavy, cast Meehanite frame absorbs vibration, results in long life.



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mained unpaid when the suit was filed. The substandard concrete delivered in the period of July 27, 28, and 29 would have had a value, as we have said, of $2,200, had it been of the quality required by the contract. There is no contention that the substandard concrete was delivered in bad faith. We see from the foregoing that after it developed that the deliveries of concrete on July 27, 28, and 29 did not conform to the requirements of the specifications, an adjustment was readily worked out whereby the plaintiff (W. D. Miller Company) allowed the defendant (contractor) a credit of $417.56, and when the defendant (contractor) passed on the credit to the Navy, all differences were composed."

Silicosis not Accidental

A reader asked this legal question: "Can an employee recover compensation or insurance for silicosis as an accidental injury?" The answer is that generally he cannot.

For illustration, in *Concrete Materials Company v. Employers Mut. Liability,* 19 N. W. (2d) 523, note the facts brought out in the testimony.

An employee sued the Concrete Materials Company to recover damages for injuries which he alleged were sustained by reason of negligence of his employer in failing to provide a safe place in which to work. The employee alleged that as a result of such negligence, he contracted a disease known as pneumoconiosis or silicosis.

The Concrete Materials Company carried insurance to protect it against liabilities, but the insurance company denied liability on the grounds that the illness claimed by the employee was not "accidental." In other words, the insurance company defended the suit on the grounds that its accident policy does not cover occupation diseases.

The higher court held that the Concrete Materials Company was not protected by the policy. This higher court held that restrictions in an insurance policy are valid, and that the holder of the policy is fully obligated by such restrictions. The court said that the disease silicosis is not covered by an "accidental" insurance policy, and that the failure of the holder of an insurance policy to read it and know the limitations does not in any respect obligate the insurance company.

Lease Must Be in Writing

The Statute of Frauds distinctly specifies that all valid lease contracts involving real estate must be in writing.

For instance, in *Snater v. Walters,* 98 N. W. (2d) 302, the testimony showed that one Snater is the president of the Missouri Valley Limestone Company and obtains leases for it. He is a man of wide experience in the limestone business. Snater pleaded that a land owner, named Walters, had orally granted him the right to explore and prospect for limestone and the right to quarry, produce, and sell the same.

Snater pleaded further that the conditions of the oral agreement were substantially as follows: (a) he (Snater) would immediately pros-

KOLMAN Radial Stackers Minimize Material Segregation

100'x24" Stacker is one of four Kolman Stackers used in the production of aggregate at Squaw Valley, California, in preparation of roads and site for the 1960 Winter Olympic Games. Stackers in the background are 70'x24".

PNEUMATIC-TIRED STACKERS IN LENGTHS UP TO 150 FEET

Reports of outstanding performance by the Kolman Model 101-R Radial Stacker are rolling in from all parts of the country. Owners are enthusiastic about bonus features offered by the Kolman Stacker — features like cable suspension of the boom, two-position wheels, balanced electric drive on the head section, power lift, power travel, and cam hinge. Sizes up to 150 feet long build larger stockpiles with a single setting.

MINIMUM SEGREGATION

Kolman's cable suspension design eliminates the segregation encountered with stackers having fixed discharge heights. By raising the stacker as the pile is built, the fall of material is kept at a minimum.

MAXIMUM PORTABILITY

Even the largest Kolman Stackers are on dual pneumatic tires that roll easily on any level surface. Wheel assembles are mounted in quick-change frames to easily shift from radial arc position for stacking to parallel position for moving from one location to another in the stockpile area.

150'x30" Stacker shown includes electric power lift and electric power travel for finger-tip control of stacker discharge position.

100'x24" Stacker in the background stockpiles sand produced with an 8'x48" double-deck vibrating screen on a Model 101 Kolman Portable Conveyor-Screen Plant.

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Rock can't jam . . . hourly operating costs lowered

The unique design of the Simplicity Grizzly Feeder, which combines feeding and scalping in one operation, eliminates rock jams thus assuring positive uniform flow of material into the crusher.

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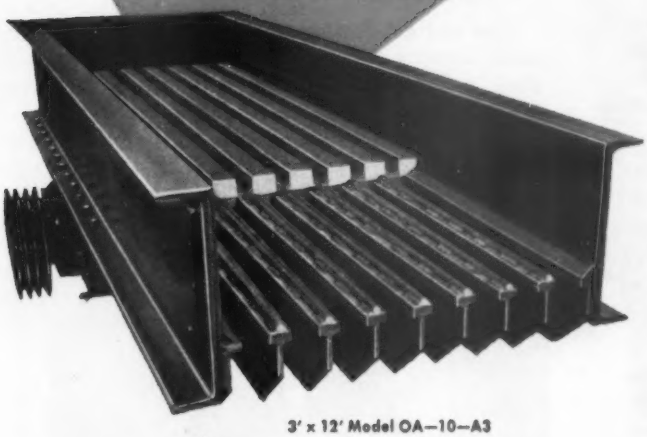

3' x 12' Model OA—10—A3

The Grizzly Feeder costs less than 50% of the combined apron feeder and scalper . . . weighs considerably less . . . makes a more compact plant . . . and reduces loading height by several feet. While these factors show up so prominently in portable plant production, they are just as effective in a permanent plant installation for the crushed stone, sand and gravel and mining industries.

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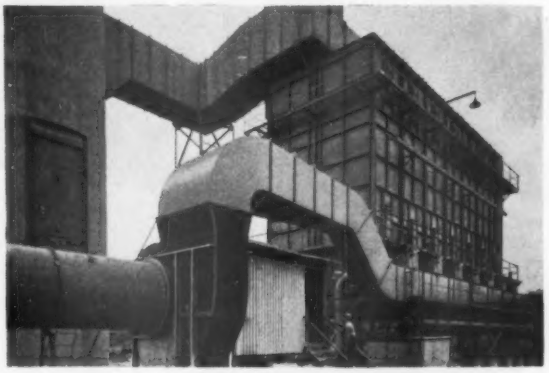
Sonic cleaning — patented and available exclusively from Dracco — provides three operating advantages: *lower back pressure* through effective dust removal; *longer bag life* since bags are not flexed, creased or shaken; *lower maintenance* through elimination of moving parts within the collector.

Cleaning by low-frequency sound waves has been conclusively proved in full-scale field operations on both Glass-Bag Filters and on conventional baghouses using cotton and synthetic bags.

Sonic cleaning is recommended for cement mill applications (kilns, grinding, classifying, materials handling), electric and open hearth steel furnaces, metallurgical furnaces, rock dryers, calciners, fusing furnaces, chemical processes and related applications. You can use it wherever mechanical shaking is undesirable or unsuitable and eliminate the shakers.

You can get further information on Dracco sonic cleaning and expert consultation on your dust control requirements from: Dracco Division of Fuller Co., Harvard Avenue & East 116th Street, Cleveland 5, Ohio.



Proved in service — Dracco Glass-Bag Filter equipped with sonic generators cleans cement kiln gases. Sound waves dislodge collected dust without wear or fracture of cloth.

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL INDUSTRIES

pect and explore by core-drilling at his expense to determine whether it was economically feasible; (b) Snater agreed to keep Walters informed as to results of prospecting; (c) if found feasible, Snater would be required to commence quarrying operations not later than two years later; (d) the term of the lease would extend for a period of 20 years; and (e) Snater was to pay royalties of 15 cents per ton for limestone quarried, payable at the end of each month's operations.

The lower court upheld the validity of this lease agreement, but the higher court promptly reversed the verdict, saying:

"The alleged oral agreement and the one found by the lower court are for the creation or transfer of an interest in land and come squarely within the provisions of the Statute of Fraud."

$63,170 Damages

Considerable discussion has arisen from time to time over the legal question: What legal duty do officials and employees of a quarry have to keep the premises clear and free of dynamite caps, and thereby protect persons who rightfully come onto the premises against injuries?

Last month a higher court rendered an outstanding decision which clearly answers this legal question.

For instance, in *Dezendorf Marble Company v. Gartman,* 333 S. W. (2d) 404, the testimony showed these interesting facts: A man named Gartman was employed by the Dezendorf Marble Company as a dragline operator in a rock quarry. Saturday was not a regular working day, and the company's superintendent, Van Wigington, asked for a volunteer who would come to the quarry on Saturday and help him with some work. Gartman volunteered to help and told Wigington that he and his family were planning to be in that locality that day anyway.

On Saturday Gartman and his family arrived at the quarry at about noon. Gartman had with him his wife, Bessie, and his three minor sons. Wigington asked Gartman to start the dragline and break up some rocks that had been blasted loose. The large rocks needed to be broken into smaller pieces so that the company's crew could begin processing them on the next working day. Wigington helped Gartman start the dragline, and Gartman broke rocks for about an hour and a half. While Gartman was breaking rocks with the dragline, Mrs. Gartman and her boys walked about the premises. Jimmy Gartman, 8 years of age, found an electric blasting cap with yellow and blue leg wires lying on the ground. After Jimmy had picked the cap up and crumpled the wires, he put it in his pocket and carried it home. The next day while the three Gartman boys were playing with an electric train set, Jimmy showed the blasting cap to his brother, Jerry, 14 years old. Jerry had seen something very similar to the blasting cap in a trash can behind a radio shop near his home and he thought it was a radio part. He first connected the cap to his toy radio and later to a toy electric train transformer. The blasting cap exploded in Jerry's eyes as he turned the switch on the toy train. Jerry suf-

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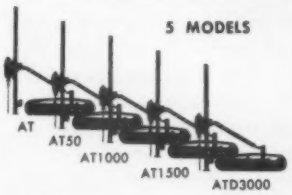

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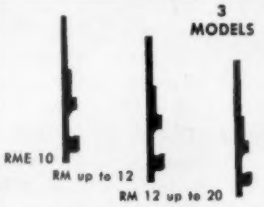

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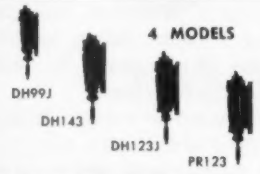

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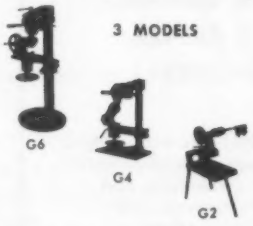

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fered severe injuries, and his parents sued the Dezendorf Marble Company for $63,170 damages.

During the trial, testimony was given that officials of the quarry company knew that at various times in the past children had come upon the premises. Also the superintendent of the quarry company knew on Friday that Gartman's children were coming onto the quarry premises the next day; yet no special effort was made to inspect the premises and discover any dynamite caps that might be lying around.

The higher court held the quarry company liable to Gartman for $63,170 damages and said:

"Jerry thought the blasting cap was a radio part. He did not know that it was dangerous to play with or that it might explode and hurt him. Jimmy did not know the cap would hurt his brother when he gave it to him, nor did he realize that it was dangerous to pick up the cap, put it in his pocket, and take it home. Appellant's (Dezendorf Marble Company's) business was quarrying rock. In this business, blasting by dynamite or other explosives is essential and . . . dynamite caps are utilized. Sometimes there are misfires, by which is meant that all caps or dynamite are not exploded. The landowner cannot escape liability for bodily harm to trespassing children caused by a structure or other artificial condition maintained on his land by simply establishing that such structure or other artificial condition was not unusually attractive to children."

This higher court went on to explain that in the area in which the Dezendorf's quarry is located it is the custom to keep a written record of all dynamite caps that are deposited in the magazine, of all caps that are checked out from the magazine each day, and of all caps returned to the magazine at the end of the day. One of the reasons for this custom is to protect against lost or misplaced caps. The officials of the company knew about this custom; yet no person kept any type of record at the quarry. The court indicated that this failure to maintain records of dynamite caps is negligent, and that the quarry company might not have been liable for $63,170 damages for injuries to Jerry if the testimony had shown that the quarry company's officials and employees had exercised due care and diligence by keeping these records. The court said:

"Jake Gonzales (official) knew these things and realized that a dynamite cap is dangerous even to adults if it is left out on the ground. He also realized that any normal child would be attracted to and enticed into handling a dynamite cap if one is left lying on the ground. The evidence shows that misfires are common, and (that) after each shot a thorough check should be made to make sure all are exploded."

Duty to Eliminate Attractive Nuisances

The law of "attractive" nuisances is applicable only to children under 10 years of age. In *Massie v. Copeland,* 233 S. W. (2d) 449, the higher court said:

"A normal fourteen-year-old boy is of high school age. He is well advanced."

The law is well established that the owner of real property is legally obligated to maintain his premises free of "attractive" nuisances, especially if he knows that children under 10 years old are accustomed to play on or around the premises, or pass therethrough.

In answer to inquires from readers, here is the law:

A possessor of land is subject to liability for bodily harm to young children trespassing thereon caused by anything which he maintains upon the land, if (a) the place where the thing is maintained is where the owner of the land knows or should know that such children are likely to trespass; and (b) the condition is one of which the owner knows or should know involves an unreasonable risk of death or serious bodily harm to children; and (c) the children because of their youth do not realize the risk involved in intermeddling in it or in coming within the area made dangerous by it; and (d) the use to the land owner of maintaining the thing is slight, as compared to the risk to young children.

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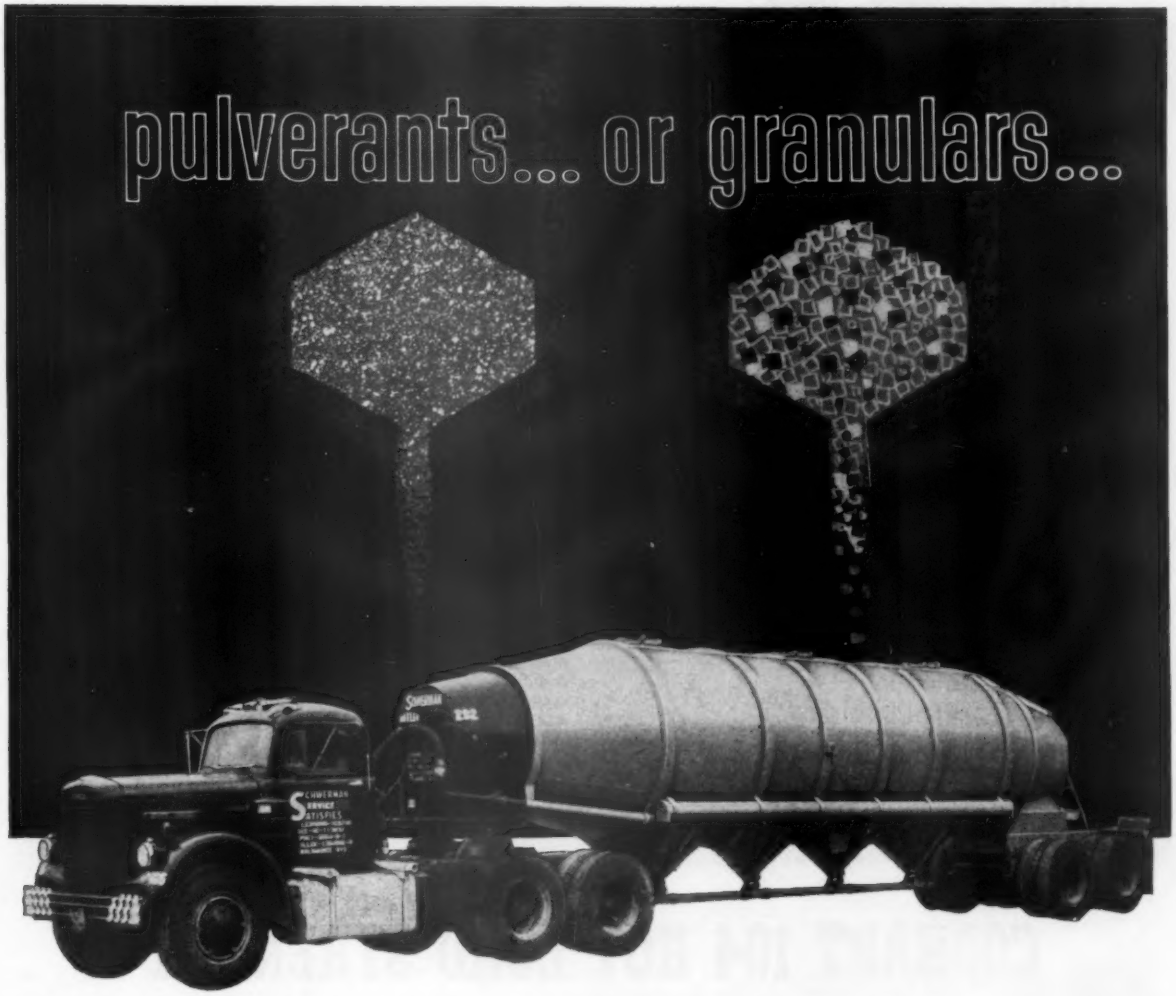

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No matter what dry bulk commodities you handle, you'll make more hauls per day and more profits per haul when you switch to versatile Butler Pneumatic Trailers.

No other trailer can match Butler's exclusive "P-D" system of pneumatic air delivery for efficient unloading of such a wide range of dry flowables. In a Butler trailer, there are no interior belts or liners to wear out. You deliver fast, even on inclined ramps, and still get positive, 100-percent clean-out. Valve adjustments are not at all critical. Regardless of the material, unloading is a simple, near-automatic job. Your customers need no special receiving equipment, for either horizontal or vertical delivery.

Butler's cylindrical shape saves weight, and it's the strongest, safest design yet developed for a pressure vessel. Code and ICC safety factors are incorporated. And only Butler so completely automatically welds all vessel seams and components to eliminate stress and assure highest strength.

Put a team of these unique Butler "P-D" trailers in your fleet and watch them pay you dividends for years to come. We will be glad to advise you if your product can be readily delivered. Simply write to the Butler address nearest you for full details.

CELEBRATING 60 YEARS BUTLER FABRICATING METALS

BUTLER MANUFACTURING COMPANY

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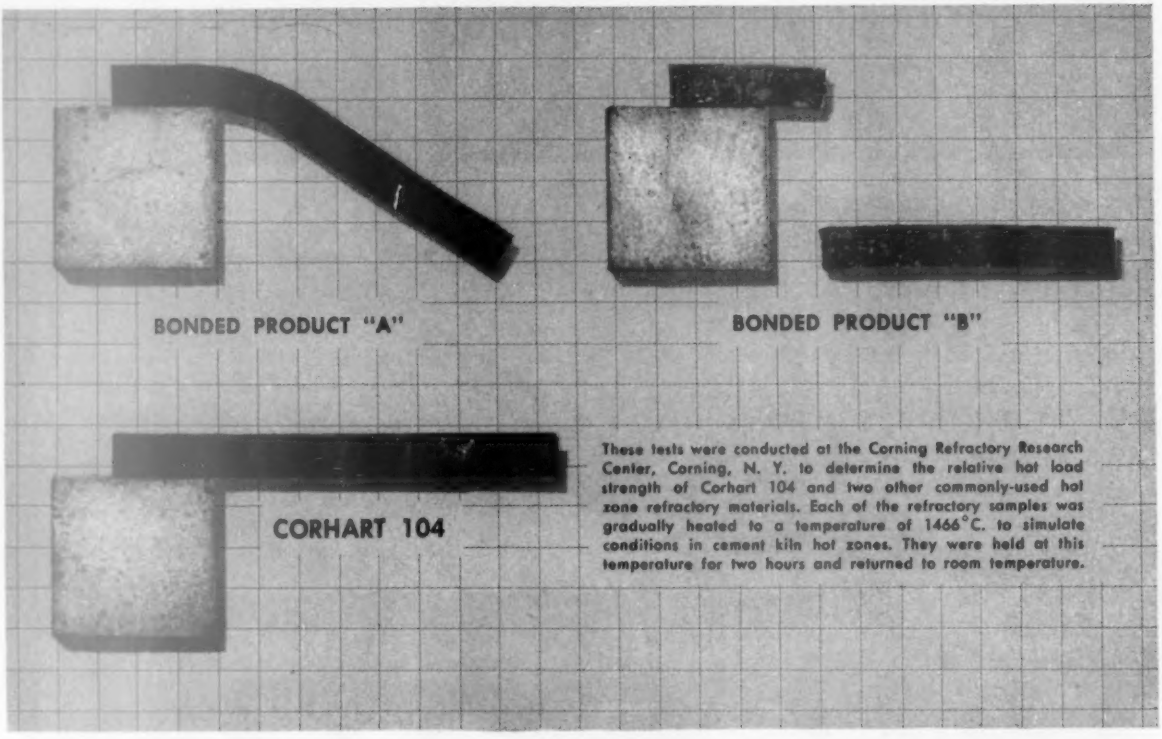
1061 SIXTH AVENUE S.E., MINNEAPOLIS 14, MINNESOTA

Manufacturers of Equipment for Transportation, Bulk Storage, Farming, Outdoor Advertising • Metal Buildings • Plastic Panels • Contract Manufacturing

CORHART PROVES IT IN THE HOT SPOTS!


BONDED PRODUCT "A"
BONDED PRODUCT "B"
CORHART 104
These tests were conducted at the Corning Refractory Research Center, Corning, N. Y. to determine the relative hot load strength of Corhart 104 and two other commonly-used hot zone refractory materials. Each of the refractory samples was gradually heated to a temperature of 1466°C. to simulate conditions in cement kiln hot zones. They were held at this temperature for two hours and returned to room temperature.

CORHART 104 HOT LOAD STRENGTH halts premature ring failures!

MANY leading cement producers are substantially increasing kiln output by utilizing Corhart 104 as their hot zone refractory. Its extremely high hot load strength (see above) is one of the primary properties responsible for helping eliminate costly premature repair shutdowns.

Corhart 104 is manufactured by an exclusive fusion cast process which creates a strong, non-porous interlocking crystalline ceramic structure. It is electrically-melted at temperatures exceeding 4500° F., giving it a built-in 1000°F. "margin for error." The high hot load strength of Corhart 104 gives you a stable refractory unaffected at temperatures where conventional basic refractories begin to soften.

High hot load strength is only one of *many* Corhart 104 properties responsible for its superior resistance to the abuse of thermal cycling, sustained high temperatures and abrasion in the most severe wear areas of cement kilns. As a result, Corhart 104 consistently outlasts other hot zone refractories by at least 2-to-1.

A Corhart engineer will be glad to help you better utilize conventional refractories in a Corhart "Balanced Lining." Corhart Refractories Company, Incorporated, 946 Commonwealth Bldg., Louisville 2, Ky.

QUALITY ECONOMY ENDURANCE

CORHART REFRACTORIES COMPANY

A subsidiary of Corning Glass Works

The words "Corhart", "ZAC" and "Electrocast" are registered trade marks which indicate manufacture by Corhart Refractories Company, Incorporated.

Manufacturers' News

D. M. Davidson

DONALD M. DAVIDSON, president of the E. J. Longyear Company, Minneapolis, Minn., and a geologist with a worldwide reputation, died unexpectedly September 15. He was 58. Mr. Davidson had been president of the Longyear Company since June, 1958.

Dr. Davidson graduated magna cum laude from the University of Minnesota in 1925 and received a Ph.D. in geology from the university in 1928. Between 1928 and 1939 he rose to chief geologist and senior engineer for Selection Trust, Ltd., London. During this period his work made him well known in the African copper belt and carried him to the Near and Far East, Europe, North and South America.

Dr. Davidson joined Longyear in 1939 as chief geologist. He was later head of the Mining Division and became vice-president in 1949. From 1953 to 1954 he was president of the Society of Economic Geologists. He served as a consultant to the U. S. Atomic Energy Commission, U. S. Bureau of Mines, U. S. Corps of Engineers, the President's materials policy commission, and many other government boards and commissions.

J. C. Cox has been appointed sales manager for Shawnee products by the Parsons Company, Newton, Iowa, a division of Koehring Company. He will be in complete charge of sales and promotion of the Parsons-Shawnee line of backhoes, loaders, and other attachments for utility tractors.

Mr. Cox has a number of years experience in the field of light industry. Before joining Parsons he was associated with Sherman Products, Incorporated.

J. J. ORR has been named director of engineering, United States Rubber Company, succeeding CARL A. OSTLING who is retiring after 22 years of service with the company.

Mr. Orr joined the rubber company as an electrical engineer in New York in 1931. Serving in positions of increasing responsibility he became manager of plant engineering in 1943 and in 1956 was named assistant director of engineering.

WILLIAM R. TISE has been appointed chief engineer for conveyor products sales by United States Rubber Company. He has been West Coast sales engineer for the department, but will now operate out of the rubber company's Passaic, N. J., plant, manufacturing and sales headquarters for its conveyor products department.

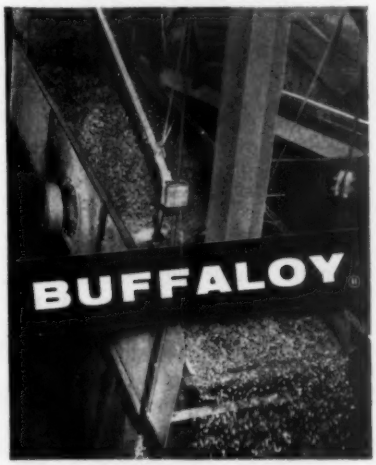
JOHN E. SCHORK has been appointed director of manufacturing of Research-Cottrell, Incorporated. Mr. Schork joined Research-Cottrell as a project engineer in February, 1956, and has since served on a number of company projects and committees as assistant to the president. Prior to joining Research-Cottrell Mr. Schork was plant superintendent with Hudson Smelting and Refining Company.

The Babcock & Wilcox Company has announced that it is placing on the market three new lines of firebrick recently developed by the company's Refractories Division in Augusta, Ga.

The new high temperature firebrick are the result of a two year study by the company aimed at servicing the cement, chemical, metals, petroleum, and glass industries with a broader range of quality firebrick and other refractories.

Based on industry classifications, the KAO-HB is high burn superduty; KAO-60 is 60 percent Alumina; and KAO-70 is 70 percent Alumina firebrick.

SURE WAY TO CUT
SCREENING COSTS



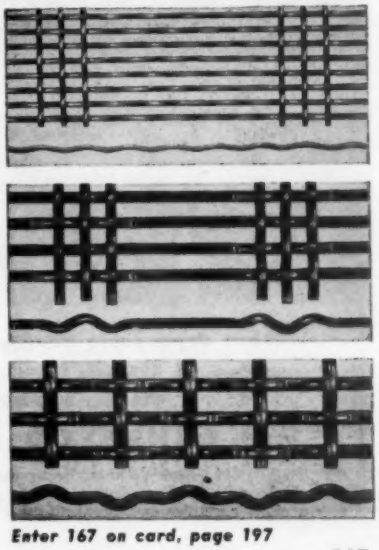
anti-abrasive
VIBRATOR PANELS

You'll be time and money ahead with Buffalo Anti-Abrasive Screens. Woven from a special formula, high carbon steel wire, here are superior panels that provide many extra hours of service. Resistance to abrasion and ability to cope with heavy shock loads are unequalled, even by higher priced panels.

Long experienced in serving the mineral aggregates industry, Buffalo Wire Works possesses the necessary skills to produce a wide selection of weaves and mesh sizes, with virtually any type of edging, for meeting your needs precisely.

You'll want the whole story in New Bulletin 600P. Write.

BUFFALO WIRE WORKS COMPANY, INC.
526 Terrace, Buffalo 2, N. Y.



Enter 167 on card, page 197

The president of Link-Belt Company has announced that the Italian firm of Orenstein & Koppel of Milan has been licensed to manufacture and sell Link-Belt shovel cranes in Italy, and to sell them in other Common Market countries through Link-Belt, S. A., Geneva, Switzerland. GIOVANNI MASTRACCHI MANES is president of the Italian firm which manufactures a wide range of excavating and construction equipment.

Smith Engineering Works, Milwaukee, Wis., a division of the Barber-Greene Company, Aurora, Ill., has appointed ALBERT NOVARA to the post of advertising manager. He has a background of 15 years of industrial advertising with both manufacturers and agencies, and 4½ years as a public relations specialist with the AAF during World War II.

Mr. Novara will have charge of all advertising and sales promotion activities in connection with Telsmith Equipment for quarries, gravel plants, and mines.

The appointment of W. A. CROWDER, 2621 W. Boston St., Seattle, Wash., as a representative for the Lehigh Fan and Blower Division of Fuller Company for both sales engineering and customer service, has been announced.

Mr. Crowder currently deals in heating, ventilating, air conditioning, boiler-room and power plant equipment, and combustion testing instruments; and was formerly in the wholesaling of this kind of equipment for a number of years.

The new Lehigh line includes draft and industrial fans. Territory to be covered includes central and western Washington, and Alaska.

JOSEPH P. HENSEL has been named manager, machinery sales, of the Pennsylvania Crusher Division, Bath Iron Works Corporation, West Chester, Pa. and will be working out of West Chester.

Mr. Hensel has been with the sales department of Pennsylvania Crusher Division since 1950, most recently as district sales representative in the St. Louis, Mo., territory.

Replacing him in this latter capacity is GEORGE O. THOMPSON. Mr. Thompson has been with the division since 1957 as a sales engineer in the Philadelphia area. He will headquarter in St. Louis.

H. E. Weyrauch

HERBERT E. WEYRAUCH has been appointed electronics sales engineer for Flo-Tronics Corporation, Minneapolis, Minn. He will have sales engineering responsibilities for Flo-Tronics developments of systems for control of quantity measurement through solid state logic controls and transistorized control instruments, and for magnetic control systems used in automation of mechanical conveyors.

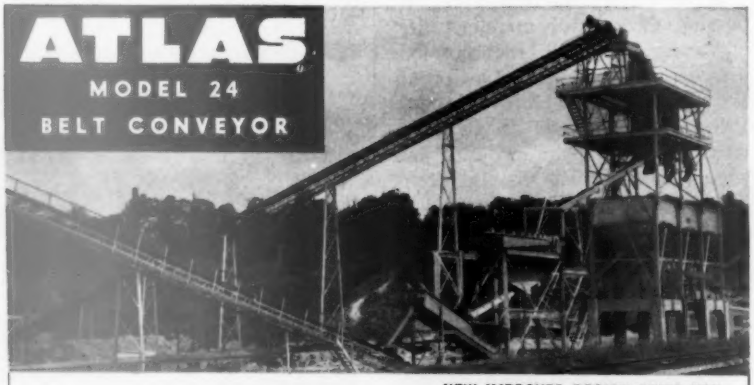
Mr. Weyrauch's sales and engineering experience in the electronics field includes three years as commander of the U. S. Naval Computing Machine Laboratory in St. Paul, and employment with Maico Electronics Incorporated, and with Dahlberg, Incorporated.

The Chicago Pneumatic Tool Company has announced the appointment of JOHN KACMARIK to the position of general manager of the company's plant at Franklin, Pa. He has been with Chicago Pneumatic since 1932. Prior to this new post, Mr. Kacmarik was general manager of the company's plant at Utica.

He will be responsible for all activities at the Franklin, Pa., plant which is the company's engineering and production center for air and gas compressors; diesel, gas, and dual fuel engines; and REICHdrill drilling rigs.

Mr. Kacmarik succeeds H. E. MOORE who is retiring after 41 years with the company. Mr. Moore started as a production apprentice at Franklin in 1919, and was made plant superintendent in 1927. He held that position until 1955 when he became general manager.

ATLAS
MODEL 24
BELT CONVEYOR



NEW IMPROVED DESIGN GIVES YOU

- PRE-ENGINEERED DESIGN
- PRE-FABRICATED SECTIONS
- STANDARDIZED COMPONENTS
- FACTORY ASSEMBLED OR KNOCKED DOWN SECTIONS
- QUICK SHIPMENT
- FAST, LOW COST ERECTION
- LOW OPERATING COSTS

Write for Bulletin 24A

Model 24 Stationary Belt Conveyors are available for 18" through 48" belt widths with 24" and 42" deep truss frames. Designed for handling gravel, sand, stone, rock, slag, coal, ore and other bulk materials . . . the new Model 24 design provides greater capacity output and lower input power consumption.

When dependable conveying and loading equipment is needed, be wise — ask for Atlas.

See Your ATLAS Distributor or Contact

ATLAS CONVEYOR CO., CLINTONVILLE, WISCONSIN, U.S.A.

Manufacturers of portable and stationary conveyors and bucket elevators for handling loose material such as sand, gravel, crushed stone, coal, coke, cement, etc.

Enter 168 on card, page 197

NORTH AMERICAN SOLVES* "DIRTY-BAG" PROBLEM

WITH THEIR NEW KLEEN-PAK RAYMOND MULTIWALL

Cleaner bags, brighter brand identification and cleaner housekeeping in the packing room and warehouse are the benefits received by North American Cement Corporation, and their customers, with their new Kleen-Pak multiwall developed for them by Raymond Bag Corporation. By using known bag manufacturing techniques, Raymond was able to eliminate the messy, trouble causing perforation below the valve, which up to now has been standard on bags used for cement, mortar, and other fine materials. Now, North American, a foremost innovator of palletizing and fast truck delivery, speeds products in a cleaner, more salable package to their customers.

Raymond BAG CORPORATION

Middletown, Ohio — A Division of Albemarle Paper Mfg. Co.

*This is another example of how Raymond Multiwall experience and service pays off for multiwall users. Let a Raymond Representative serve you.

Maker of RUGGED Multiwall Packaging for Industry • Atlanta • Baltimore • Chicago • Kansas City • Louisville • New York

COLOR IS IMPORTANT!

NO. 3 OF A SERIES

The early forge man, the blacksmith, knew by the particular shade of fiery red when steel was heated to the right temperature for perfect heat treatment. The modern heat treater uses automatic temperature controls to maintain the same color and temperature to guard his quality. Each Coates ball is controlled for this important step in heat treatment and is typical of the care in manufacture, the rigid quality controls and adherence to product specifications that guarantees the uniformity of Coates Triple-Forged Carbex Grinding Balls.

Coates Grinding Balls are made of fine-grained, high-carbon steel. They are especially forged to attain more perfect sphericity, then heat treated to extreme hardness, but with toughness to prevent shattering under the stress of milling. Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

C657-4

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

COATES STEEL PRODUCTS COMPANY

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

R. B. Worley

ROBERT B. WORLEY has been appointed vice - president, lubricating sales of the Warren Refining and Chemical Company, Cleveland, Ohio, according to an announcement by IAN L. CARMICHAEL, president.

Mr. Worley's career with Warren began in 1942, after six years as a sales engineer with Lubri-Zol Corp., also of Cleveland. Mr. Worley became sales manager of Warren in 1949.

Two producers of machinery for process industries have been merged. DANIEL RICHMAN, president of both companies, has announced that International Process Equipment Company, Dayton, Ohio, has become a division of The Patterson Foundry and Machine Company.

All production and management activities will be conducted at the Patterson facilities in East Liverpool, Ohio. The sales forces of the two firms have been expanded, and International will operate as International Process Equipment Company Division of Patterson.

The company reports the merger will allow International to triple its production and proceed with introduction of several new products; and although International and Patterson have several competitive products, the merger will allow Patterson to offer a broadened line of equipment, particularly in the field of agitation.

Patterson, a 95-year old machinery maker, was purchased by Ferro Corporation in 1956, then acquired by Mr. Richman in December of 1959.

Appointment of four SKF Industries, Incorporated executives to posts in Altoona, and Philadelphia, Pa., plants have been announced.

WILLIAM C. WRIGHT was named to the newly created post of general manager, Altoona division. JAMES A. GRAHAM, formerly plant manager, Philadelphia, succeeds Mr. Wright as production manager; STANLEY KABALA, formerly Altoona plant manager, was appointed plant manager, Philadelphia; and WOODROW WILSON, Altoona supervisor of factory engineering and maintenance, was named Altoona plant manager.

The J. I. Case Company has formed a Central Parts Division. The company reports that the development of a central parts division for the control and management of parts inventory while meeting the customer requirements for service parts would also enable the company to reduce its inventory by several million dollars.

T. J. GARBEFF, formerly manager of the company's plant at Stockton, Calif. has been named manager of the new division. He joined the Case Company at the Rockford, Ill. plant as a college graduate trainee in 1949. Following his training period, he worked at most phases of the operations at the Rockford plant. In 1957, after two years as manufacturing superintendent, he became assistant manager and later manager of the Case plant at Stockton, Calif.

W. A. Goodwin

WILLARD A. GOODWIN was recently appointed sales engineer for the Industrial Fabrics Division, Albany Felt Company, Albany, N. Y. He is now servicing accounts in the South and makes his headquarters in Greenville, S. C. In addition to offering industrial fabrics of all types, he will serve as consultant on dust collection problems.

Mr. Goodwin served several years in managerial capacities for the Deering Milliken Company and more recently was engaged in textile sales work for Steel Heddle Manufacturing Company before joining Albany Felt Company.

E. L. LUDVIGSEN, president of Fuller Manufacturing Company, Kalamazoo, Mich., has been elected to the board of trustees of Tri-State College in Angola, Ind.

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants

OPEN CHAIN LUBRICANT INCREASES CHAIN LIFE UP TO 300%

Penetrates, lubricates, prevents rust. Lubricates deep into chain linkage to reduce friction on pins, rollers, bushings, pressure surfaces. Corrosion inhibitor prevents rust in vital working mechanisms. Lubricates close-tolerance internal surfaces to increase chain life up to 300%. Highly recommended for all climatic conditions to stop rust and corrosion even in salt atmospheres.

Packaged in handy 16 oz. aerosol spray-on containers or in bulk — send for a free trial sample.

ANTI-FRICTION COMPOSITIONS HAVE NO MELTING OR DROPPING POINT

Packaged in 14½ oz. cartridges for handy application with lever-type cartridge guns for constant protection to roller, ball, sleeve bearings and sliding surfaces in "hot" bearing applications or in areas with high ambient heat. Exclusive formulas have no melting or dropping point; moisture resistant; will not wash out; exceptional metal adherence properties; temperature reducing qualities; high extreme pressure values. Available in two grades. Whitmore's Anti-Friction Composition No. 1 (light density), recommended for high speed, high temperature applications. Anti-Friction Composition No. 2 (heavy density), for low-speed high-temperature applications or loosely-fitted bearings. Specify No. when requesting free trial sample.

68 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Open and Enclosed Chain
- Speed Reducers
- Enclosed Gear Cases
- Roller, Ball and Sleeve Bearings
- Wire Rope and Cable
- Hydraulic Units, Torque Converters

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO • VULCAN 3-7272

Enter 171 on card, page 197

STARSTEEL
HEAVY DUTY **SPACE SCREENS**

There are three reasons for the exceptional durability of STARSTEEL Screens:

1. Wire drawn from specially alloyed steel, exceptionally hard, yet unusually ductile.

2. Extreme care in fabrication—tight and rigid weaving, special processing to insure a perfectly level, buckle-free surface.

3. Precision application of hook strips to allow maximum tensioning on machine frames to prevent distortion, fatigue and breakage.

The longer wear of STARSTEEL Screens promises, not only savings in screen replacements and downtime, but higher output and uniformly higher quality products. *Write for catalog.*

QUICK SHIPMENT *Most weaves, meshes, gauges*

Star will produce screens or cloth from stainless or other steel alloys, Monel, brass, bronze, copper, aluminum and most other metals that can be drawn into wire. Inquiries invited.

STAR
WIRE SCREEN & IRON WORKS, INC.
2515 San Fernando Road • Los Angeles 65, Calif.

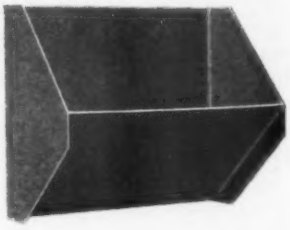
Subsidiary of Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.

Enter 172-A on card, page 197

TOUGH
CONVEYING and ELEVATING CONDITIONS ?

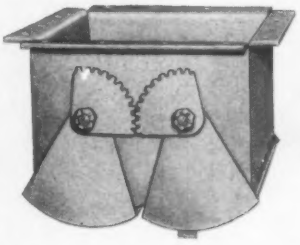
STANDARD METAL'S users lick TOUGH problems Every Day!

STANDARD METAL'S CONTINUOUS ELEVATOR BUCKET STYLE No. 2



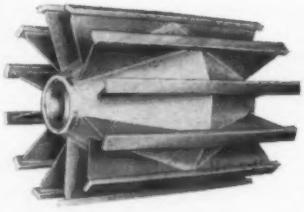
This long-life bucket resists wear — delivers outstanding service and economy under severest conditions. This style is just one of the complete line of low-cost, rugged steel buckets manufactured by Standard Metal. Available in Salem, Style "A" and other continuous style buckets.

STANDARD METAL'S BIN GATES



Here's the all-steel, gear-operated Duplex Bin Gate for faster, easier material handling at minimum cost. Now supplied standard with twin bracket at bottom of gate, drilled to accommodate bolt for fulcrum lever.

STANDARD METAL'S WING-TYPE SELF-CLEANING PULLEY



Includes Taper-Lock Split Bushing to save time and trouble when mounting shaft. These pulleys are light in weight, yet their all-steel welded construction resists breaking, and delivers many years of trouble-free, low-cost service. Also available with solid hubs bored to specifications.

Contact us for full details and quotations on your particular needs in elevating and conveying equipment—for new installations or replacements. Ask for the catalog showing the complete Standard line.

STANDARD METAL MFG. CO.
110 CENTER ST. MALINTA, OHIO

Enter 172-B on card, page 197

PROOF (from Anaconda)

that a Ni-Hard Mill Liner is good to the last ¼ inch

You've heard it said many times..."A Ni-Hard Mill Liner is good to the last ¼-inch!"

Well here's photographic proof; from the Montana mines of The Anaconda Company, where the long life and outstanding performance of Ni-Hard* nickel-chromium-iron alloy liners have saved many thousands of hours of downtime. And done wonders for tonnage too – in both ball mills and rod mills, at the feed end as well as the discharge end.

This "good-to-the-last-¼-inch" performance of Ni-Hard mill liners can do wonders for your tonnage. For if ever there was a service where superior abrasion-resistance coupled with a uniform wear-rate really counts, it's in mill liners. Try a set of Ni-Hard liners in your mills and see for yourself.

Ni-Hard iron's superior abrasion-resistance and uniform wear-rate also count heavily in prolonging the life of feed spouts, pipe elbows, slurry pump liners and impellers, dust-collector cyclones, chute liners and many other parts for ore-processing equipment.

Our detailed, 58-page booklet, "Engineering Properties and Applications of Ni-Hard" suggests many ways to put versatile, long-wearing Ni-Hard to work profitably. Say the word and we'll be glad to send you a copy.

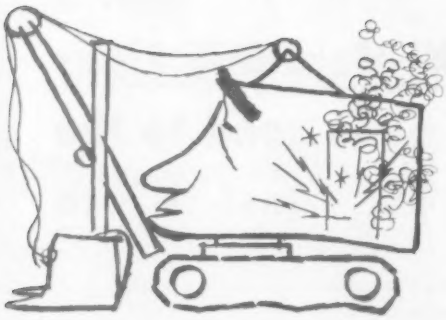
*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.

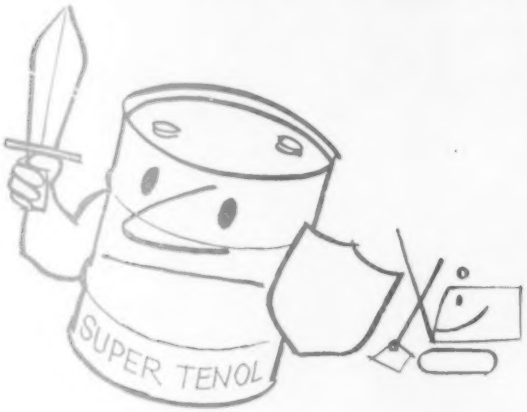
67 Wall Street INCO New York 5, N. Y.

NI-HARD®

NICKEL MAKES CASTINGS PERFORM BETTER LONGER



Diesel engines powering heavy equipment in mines and quarries can dish it out day after day. But can they take it... year after year? The record shows they can...when lubricated and protected by Sinclair SUPER TENOL® Motor Oil.



Diesels safeguarded by SUPER TENOL can withstand high temperature and stop-and-run operation... protect vital engine parts from varnish, sludge, rust and acid corrosion. The reason: SUPER TENOL combines high quality base oils with special additives. Put SUPER TENOL to work for you... call your Sinclair Representative or write

Sinclair

SINCLAIR REFINING COMPANY

TECHNICAL SERVICE DIVISION • 600 FIFTH AVE., NEW YORK 20, N.Y.

J. V. Carlin Jr.

JAMES V. CARLIN JR. has been appointed as vice-president of sales for the Acme-Hamilton Manufacturing Corporation, Trenton, N. J. He was formerly general sales manager for the Acme Rubber Manufacturing Company, a division of Acme-Hamilton.

In his new duties he will be responsible for sales of both the Acme Rubber and Hamilton Rubber divisions. Mr. Carlin has been with the company for 14 years, starting as a sales representative with the Acme Rubber Company in the Philadelphia area.

Atlas Copco A. B. has acquired the Swedish Diamond Rock Drilling Company, better known in many countries as Craelius. The acquisition was announced recently by J. E. HEUSER, president of the Atlas Copco organization in the United States. Craelius, with many overseas associates, specializes in core drilling operations for testing soil, rock strata, mines and ore deposits.

Atlas Copco sales in the United States are through Atlas Copco Eastern, Paramus, N. J.; Atlas Copco Pacific, San Carlos, Calif.; and district offices across the country. Headquartered in Stockholm, the international Atlas Copco group provides compressor and pneumatic equipment sales and service in more than 90 countries.

Fairmont Machinery Company, Fairmont, W. Va., and its subsidiary, Lecco Machinery and Engineering Company, Bluefield, W. Va., have expanded their sales organization to include the Southwest and Rocky Mountain areas and California.

Contract Engineering Company, 1727 Boulder Street, Denver 11, Colorado has been named sales representative for Colorado, Wyoming, New Mexico, Arizona, Utah, Nevada and El Paso County in West Texas. Coronado Engineering Company, 800 Welch Road, Palo Alto, California, will serve that state.

HENRY W. BOTTEN, president of The Owen Bucket Company, Cleveland, Ohio, announces the recent appointment of three new authorized distributors for the sale, repair, and serving of the complete lines of Owen clamshell buckets, and rock, scrap, and pulpwood grapples.

Euclid-Tennessee, Murfreesboro Road, Nashville, Tenn., will cover the middle Tennessee territory. The T. E. Potts Equipment Company, Incorporated, Sheridan Drive, Buffalo, N. Y., will service western New York State, including the Rochester area.

Mussens Canada Limited, 1100 Norman St., Lachine, Montreal, Que., and its branch offices will service the Canadian Provinces of Quebec, New Brunswick, and Nova Scotia.

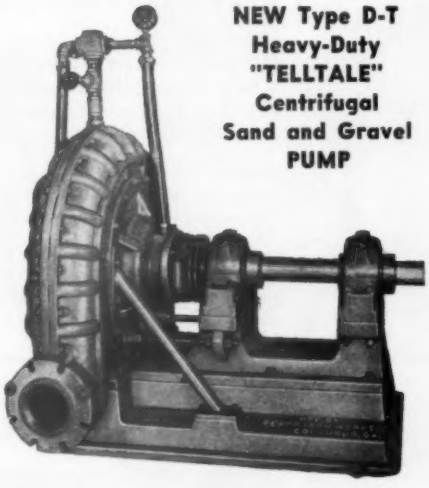
MILTON C. STAFFORD has been appointed manager of product sales of the Jones Machinery Division, Hewitt-Robins Incorporated. He was formerly Chicago district manager for Jones products.

GALE C. WICKS, who has been with Thor 15 years, has been named assistant to the president of Thor Power Tool Company, Aurora, Ill., in charge of liaison with the firm's Drying Systems Division, Chicago, Ill. Mr. Wicks, who will be located at Drying Systems, has been purchasing agent at Thor for seven years.

CLARENCE M. WULF has been appointed purchasing agent. He entered the Thor organization in 1942 in the supply stock department. He subsequently has served in the production and purchasing departments.

Badger Manufacturing Company, Cambridge, Mass. has been awarded a contract by The Atlantic Refining Company for the design, purchasing, and erection of an asphalt terminal on the New York Barge Canal at Three Rivers, approximately ten miles north of Syracuse, N. Y. The terminal, which is expected to be completed by the year end, will have capacity of 2-⅓ million gal.

NO OTHER PUMP CLAIMS BETTER PRODUCTION THAN "TELLTALE"



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

Reports of much greater "Telltale" production than pumps of the same size replaced at same spots and under same conditions are common. Reports of substantially greater production than replaced pumps of larger sizes are not rare.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

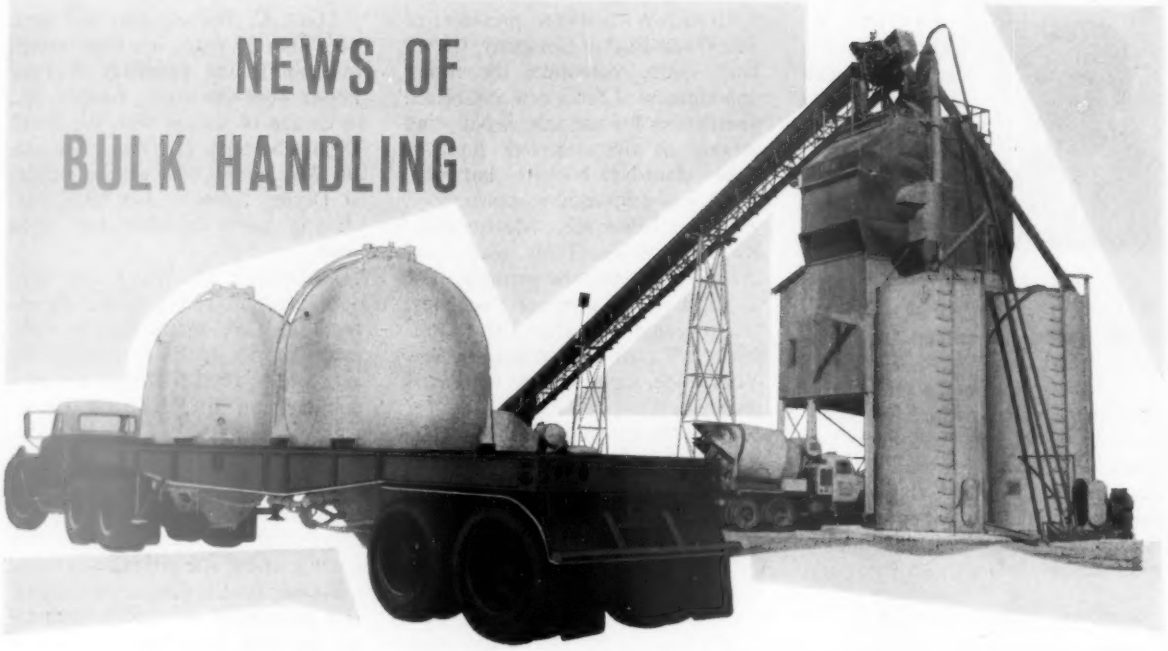
Pekor Iron Works, Inc.

ESTABLISHED 1892

LOCK DRAWER 909 FAIRFAX 2-4020 COLUMBUS, GEORGIA

Enter 175 on card, page 197

NEWS OF BULK HANDLING



. . . pneumatically

Halliburton Pneumatic Systems transfer bulk materials anywhere pipe can be run

For the past 35 years Halliburton has transferred over 500,000,000 cubic feet of materials in its worldwide service to the oil and gas industry. This pioneering of bulk handling systems and the later development of *pneumatic* systems was made possible by Halliburton's Technical Research Center, where such systems are designed. Halliburton also has *two* modern manufacturing plants which are fully equipped to produce these systems in accordance with the strictest design requirements. The resulting Halliburton Pneumatic Bulk Material Handling Systems have proven much more economical and dependable than mechanical equipment. 50 million barrels of dry bulk materials have been pneumatically handled by Halliburton during the past decade.

STATIONARY SYSTEMS

Halliburton will custom design a complete stationary pneumatic handling system to the most exacting specifications. The Halliburton engineers who have designed and built scores of these plants are also available to supervise your installation. Halliburton can do the actual construction, or if desired, provide the equipment for installation by the customer.

Standard units are designed to convey materials up to 40 cu. ft. per minute at distances of 1400 feet with 100 foot rise. Special units can be designed to move materials further . . . and faster.

MOBILE SYSTEMS

Halliburton Mobile Pneumatic Systems are available for over-the-road, rail, or marine transport.

SPECIAL PRODUCTS DIVISION

for more information
about faster, cleaner,
more economical handling
of dry bulk materials
write direct to
Special Products Division.....

Halliburton
COMPANY . DUNCAN, OKLAHOMA

F. Milligan

FRANK MILLIGAN, of Thermal & Hydraulic Equipment, Limited, Toronto, Canada, has been appointed sales agent for the province of Ontario by Morris Machine Works, Baldwinsville, N. Y.

Mr. Milligan has been active for 12 years in the field of pump equipment sales and service, first as a sales engineer and manager of mining sales with John Inglis Company, and later with Taylor Engineering & Construction Company, Limited, both of Canada. He formed his own firm, Thermal & Hydraulic Equipment, Limited, last year.

Worthington Corporation has recently appointed four distributors of the company's construction equipment. Bell Compressor Rental Company, 101 Eye St., S.E., Washington, D. C. will sell and service in the District of Columbia, Alexandria, Va., and the Virginia counties of Arlington, Fairfax, Loudoun, and Prince William; also in Maryland, the counties of Montgomery, Prince Georges, St. Marys, and Calvert, and south of U. S. Route 50 to Anne Arundel. The franchise includes: portable mixers, contractor pumps, contractors air tools, and portable air compressors.

Air City Equipment Company, Ferry Road, Bellbrook, Ohio, will distribute in eight Ohio counties including Darke, Preble, Montgomery, Greene, Champaign, Clark, Madison, and Clinton. The franchise includes: portable rotary compressors, contractors' tools, mobile drills, truck and portable mixers, big mixers, pavers, and aggregate reclaimers.

Barrett-Haentjens Sales Company 225 N. Cedar St., Hazelton, Pa., will distribute in the hard coal field territory of Northeastern Pennsylvania. The franchise includes centrifugal, vertical turbine, rotary, and power pumps, air-cooled compressors, and water-cooled compressors.

Medico Industries Incorporated, 11 Tomkins Street, Box 711, Pittston, Pa., will distribute in the Pennsylvania counties of Wayne, Susquehanna, Bradford, Lycoming, Sullivan, Wyoming, Lackawanna, Luzerne, Columbia, Montour, Northumberland, Schuylkill, Carbon, Clinton, Monroe, and Pike. The franchise includes truck mixers, big mixers, pavers, portable mixers, and aggregate reclaimer units.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, announces the appointment of Eastcoast Equipment Company, U. S. Highway 22, Mountainside, N. J. as distributor for LIMA Austin-Western crushing, screening and washing equipment.

Eastcoast Equipment's crusher territory covers 13 counties in the northern part of the State of New Jersey. In addition to the crusher line, Eastcoast Equipment is also distributor for LIMA shovels, cranes, draglines, pullshovels, and the LIMA Roadpacker vibratory compactor.

GEORGE HAVAS has been appointed vice-president and director of engineering of Kaiser Industries Corporation. Associated with the various Kaiser companies since 1928, when he joined the Kaiser Paving Company as office engineer during a highway project in Cuba, Mr. Havas served as chief engineer of Henry J. Kaiser Company after 1935, and became vice-president of the company in 1945.

From 1945 until 1958, he was directly responsible for all Kaiser engineering and construction activities at home and abroad. In 1958 he assumed the position of general manager of the company's heavy construction division and the international subsidiaries.

Diamond Iron Works, division Goodman Manufacturing Company, has announced the appointment of EUGENE C. HERSCHELMAN to its Chicago headquarters staff. He was formerly manager of the crusher division, Kennedy Van Saun Manufacturing Corporation, New York.

Enter 177 on card, page 197

NEW
GILSON Porta-Screen™
PORTABLE TESTING SCREEN

Motor or hand-driven . . . operates free-standing, bolted to semi-permanent location, or on bare ground . . . dismounts in 2 portable sections . . . handles samples up to 25 lbs., 1½-in. to 200-mesh.

USE Porta-Screen FOR:
★ field inspection and testing
★ ready-mix plants
★ blacktop plants
★ concrete products plants
★ small aggregates plants
★ lightweight aggregates
★ ores and minerals
★ mass separation for research
★ screening under direct wash water

Write for literature

The new Gilson Porta-Screen
The standard Gilson Testing Screen
Gilson Sample Splitter and other accessories

GILSON SCREEN CO.
MALINTA, OHIO

Enter 178-A on card, page 197

FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL

Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 178-B on card, page 197

The Robins Engineers Division of Hewitt-Robins Incorporated, designer of material handling systems, announced today that FRANK TENCZA has been appointed chief engineer of the division.

Mr. Tencza, who joined Hewitt-Robins in 1944, has recently been chief engineer in the company's Los Angeles office. In his new position, he will be located at 157 Chambers Street, New York.

It was also announced that EDWARD H. FALLON has been appointed construction manager of the division and FRANCIS X. CONNELLY has been named assistant chief engineer.

Great Lakes Diesel Company, Cleveland, Ohio, distributors for GM Detroit Diesel Engine Division, has opened a new sales, service, and parts branch in Youngstown, Ohio. The new facility is located just south of Ohio Turnpike Exit 16 on Route 7. E. W. KONTUL is manager of the new branch, and HERBERT SPENCER is parts manager.

The appointment of R. W. DANIELS to the position of manager of services for the Organic Chemicals Division of American Cyanamid Company has been announced. He became associated with Cyanamid in 1936.

As manager of services, Mr. Daniels will have responsibility for coordinating all activities of the division's purchasing, legal, public relations, traffic, personnel services, and general services departments. He will be located at division offices in Bound Brook, N. J.

JOHN M. FASOLI has been appointed manager of commercial operations for the Organic Chemicals Division. In his new capacity, Mr. Fasoli will be responsible for coordinating activities of the division's commercial development department, and the six commercial departments which include dyes, explosives and mining chemicals, textile chemicals, rubber chemicals, petrochemicals, and intermediates.

He will be located at division sales offices in Bound Brook. Mr. Fasoli, a lawyer by profession, joined Cynamid in 1946.

D. I. Daily

DAVID I. DAILY has been appointed the West Coast sales representative for the Packaging Service unit of the Bemis Bro. Bag Company. Mr. Daily, who joined Bemis in June of this year, has been in training at the firm's packaging machinery unit in Minneapolis. He will be responsible for sales and service of all packaging equipment installed by Bemis west of the Rockies.

Before joining Bemis, Mr. Daily served three years as a field representative for the Ex-Cell-O Corporation, Detroit, Mich., and three years as general manager of the Wheeler Tank Lines, Milwaukee, Wis.

A new long-term lease plan involving all typewriter, adding-calculating machine and systems products has been announced jointly by KENNETH R. HERMAN, president of the Remington Rand Division of Sperry Rand Corporation, and ROBERT SHERIDAN, president of the Nationwide Leasing Company. Nationwide will underwrite the Remington Rand lease program throughout the country.

The plan has been developed to meet the needs of both small business and large corporations. Leases will normally range from 39 to 65 months. In special situations, it will be possible to draw up agreements for as little as two years or as long as 10 years. Renewal options are standard for all leases.

The lease plan will be available throughout the country from Remington Rand salesmen and agents selling typewriter, adding-calculating machine and systems products.

Appointment of W. C. HENDERSON as manager, utility sales, and of A. W. LEIGHTON as manager, industrial sales, Los Angeles district, has been annuonced by Allis-Chalmers Industries Group, Allis Chalmers Manufacturing Company.

product:

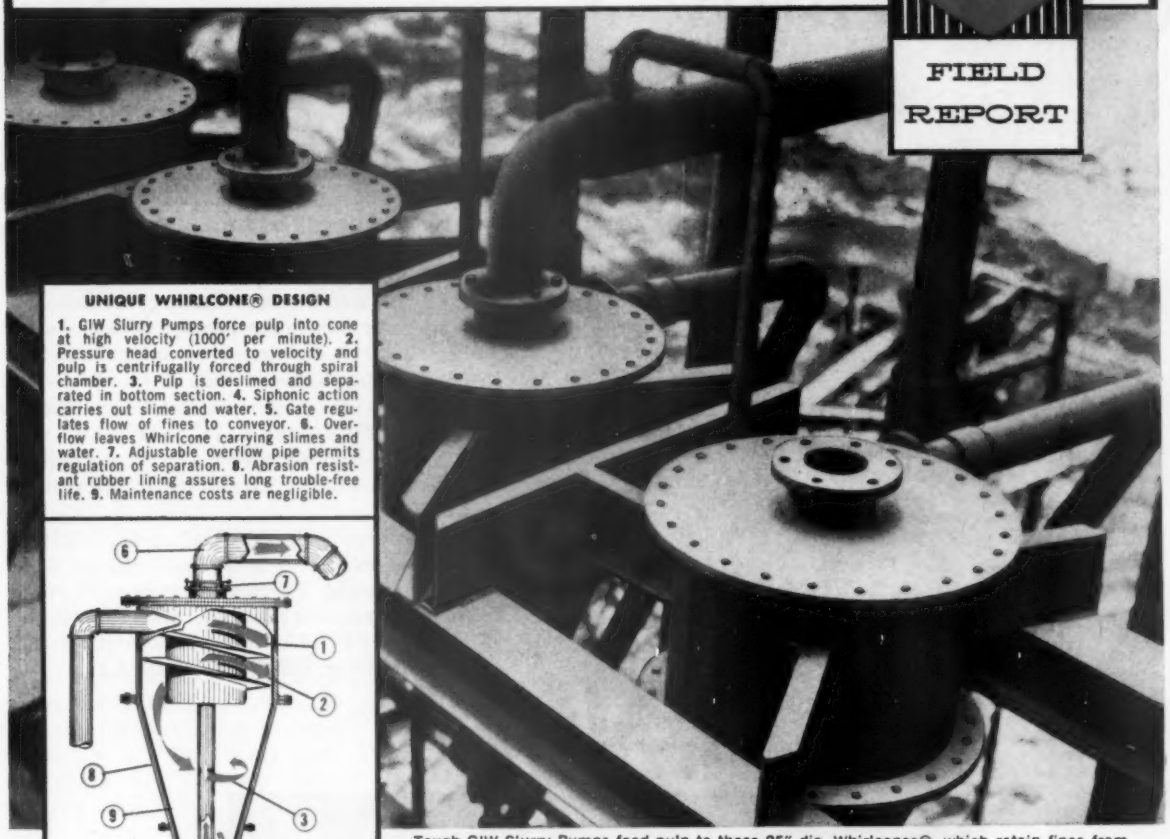
COTTRELL WHIRLCONE® SEPARATORS

customer:

BECKER COUNTY SAND & GRAVEL CO.

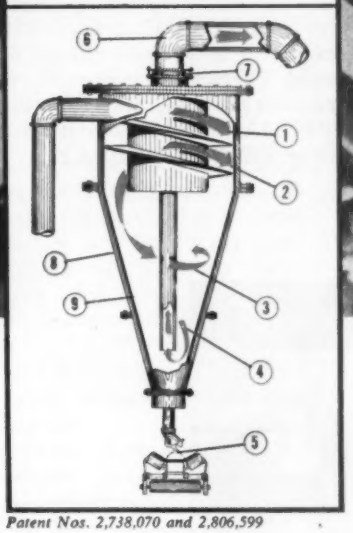
GIW

FIELD REPORT



UNIQUE WHIRLCONE® DESIGN

1. GIW Slurry Pumps force pulp into cone at high velocity (1000′ per minute). 2. Pressure head converted to velocity and pulp is centrifugally forced through spiral chamber. 3. Pulp is deslimed and separated in bottom section. 4. Siphonic action carries out slime and water. 5. Gate regulates flow of fines to conveyor. 6. Overflow leaves Whirlcone carrying slimes and water. 7. Adjustable overflow pipe permits regulation of separation. 8. Abrasion resistant rubber lining assures long trouble-free life. 9. Maintenance costs are negligible.



Patent Nos. 2,738,070 and 2,806,599

Tough GIW Slurry Pumps feed pulp to these 25" dia. Whirlcones®, which retain fines from classifier overflow. Maximum recovery rate is 20 tons per hour per cyclone. The cones will handle material from −12 mesh to lightest slime.

Whirlcone® Separators solve difficult fine recovery problems.

The retention of fines in the −50 plus 200 mesh range posed a disturbing problem for the Becker County Sand & Gravel Co., of Cheraw, S.C., primarily because the large amount of water used in processing the sand and gravel washed out the desirable fines with the minus 200 slimes.

Fourteen 25" dia. Whirlcone® wet type cyclones installed parallel in four Becker plants solved this problem completely. Operating an average of 8 hours daily, they extract up to 100 tons of clean, fine sand per hour from wash water while the minus 200 mesh slime is discarded.

Recovered fines are used to bring sand up to specifications. Thousands of tons of valuable sand, formerly lost, soon paid for the low cost of the Whirlcones®.

GIW's highly efficient Whirlcones® are also being used in the mining fields to deslime, degrit, classify, concentrate, make dam and mine backfill and to dewater or thicken where the overflow can be returned to the process or it can be discarded.

They are available in diameters from 6" to 50". Capital cost including the pump is 20 to 50% of conventional classifiers.

If you are losing fines from material −12 mesh to lightest slimes, write today. Recommendations and literature will be forwarded promptly.

COTTRELL ENGINEERING
Division of
GEORGIA IRON WORKS CO.

GIW

Manufacturers of pumps, dredges, separators and accessories.

AUGUSTA • GEORGIA

Enter 179 on card, page 197

"...he can continually view the formation of the clinker"

(at Ideal Cement Company's Houston, Texas; Ada, Oklahoma; and Tijeras, New Mexico, plants)

One man at each of these three new Ideal plants can continually check the kiln burning operation using Diamond TV. Thorough instrumentation plus this continuous visual checking gives him close control over the manufacturing operations. And, because he constantly watches the clinker formation, the operator can make prompt adjustments as needed . . . helping to make possible a better product at lower cost.

There are many other ways you can utilize Diamond TV — such as in quarrying and crushing operations, viewing conveyor belts, at transfer points and in storage and shipping operations.

Why not let Diamond's trained application engineers show you how cost cutting Diamond industrial TV can bring greater efficiency to your own plant operation? Request Field Survey FS14A. Phone Lancaster, Ohio, OLive 3-6540 or TWX 490 — TODAY.

Help Wanted:

Challenging opportunities available at Diamond Electronics for physicists, electronic and mechanical engineers. Contact C. H. Thomas, Technical Personnel.

Diamond® Electronics

DIVISION OF DIAMOND POWER SPECIALTY CORPORATION

LANCASTER, OHIO

R. H. Lewis

K. V. Arvidson

Appointments of R. H. LEWIS as service manager, and K. V. ARVIDSON as district sales representative have been announced by Flygt Corporation, Hoosick Falls, N. Y. Mr. Lewis, formerly with Homelite for 14 years, will have charge of the establishment of a complete service program and the training of distributor service personnel.

Mr. Arvidson, after a training period, will assume responsibility for distributor sales of the company's line of electric submersible pumps in Illinois, Minnesota, Wisconsin, and Michigan's Upper Peninsula. He will headquarter in Rockford, Ill.

In Brazil's southern frontier country, the third largest hydro-electric project in Latin America is under construction. KW-Dart Truck Company reports that KW-Dart trucks are being used exclusively at the Central Electrica de Furnas dam project on the Rio Grande River, more than 6,000 miles from Kansas City, Mo., where the trucks are manufactured.

The recent completion of diversion tunnels to divert the Rio Grande's flow preceded construction work on the dam itself, a 400-ft. high rock-fill structure which will create a reservoir 150 miles long. The completion date for the entire project, begun in 1958 and designed to harness much of Brazil's tremendous water power potential, was originally set for 1965, but an earlier finish is now in sight.

50 model 25SL, 25-ton, 320 hp. KW-Dart dump trucks have been used moving earth and stone, while 10 heavy-duty KW-Dart tractors are being utilized to transport cement and move heavy equipment. All 60 trucks were delivered through Cia. Importadora de Maquinas, "Comac", KW-Dart's distributor in Rio de Janeiro, Brazil.

Austin plastic connectors provide a quick fuse hook-up. Simply thread fuse from shot hole through length of connector and press trunk line into grooved slots. Then return branch line through end of connector on other side of trunk line and pull tight.

AUSTIN
Detonating Fuse

promotes blasting efficiency

Filled with a high explosive core, Austin Detonating Fuse possesses sufficient strength and speed to initiate an entire column of explosives . . . connects all holes with an effective detonating agent.

Austin Detonating Fuse is easy to handle, too. It's light in weight and flexible with a tough, waterproof coating that won't crack, chip or peel when being laid.

3 types—There's a type of Austin Detonating Fuse for virtually any purpose. Type 60 is standard. Type 100 is more powerful and for less sensitive explosives and blasting agents. Type 175 is for use with uncoated ammonium nitrates.

All 3 types are insensitive to shock, abrasion and strong electrical currents.

AA-9674

USED IN 1833 AUSTIN EVER SINCE

AUSTIN
POWDER COMPANY
CLEVELAND 13, OHIO

explosives ◆ ammonium nitrates ◆ primers ◆ detonating fuse
permissibles ◆ blasting supplies ◆ AP drill heads and bits ◆ mine tools

Enter 181 on card, page 197

New Ravens Tri-Axle earns $14,000 extra per year!

Extensive use of Alcoa Aluminum permits 25% bonus payload

Ravens-Metal Products, Inc., of Parkersburg, W. Va., designed and built these new all-aluminum Tri-Axle dump trailers to haul maximum coal payloads in Ohio, Michigan and Illinois. Engineered to take full advantage of lightweight Alcoa® Aluminum alloys, each weighs only 10,900 lb, yet can transport better than 50,000 lb of coal over public highways. That's a payload bonus of at least 10,000 lb over conventional steel units!

One of the units in our picture is owned by Diamond Trucking Company, of Strasburg, Ohio, whose president, Raymond Schaub, reports that 10,000 lb extra coal payload, over that possible with a similar steel unit, is being hauled on each of two daily 200-mile round trips—for an extra yearly profit of $14,000!

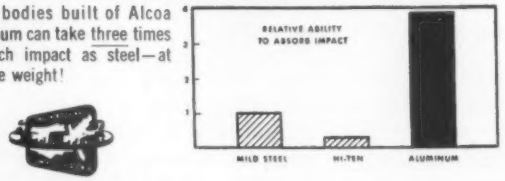
The other unit is owned by Edwards Trucking, of Dover, Ohio, and operates in the same general area. On a one-shift-per-day basis, Mr. John Edwards reports profit increases of $150 per week attributable to the all-aluminum Ravens Tri-Axle. And he adds that this figure is based only upon extra payload and does not include an added advantage that has increased his profits by a substantial, but hard to measure, amount. He finds no trouble whatever in crossing weigh scales with the Tri-Axle, whereas previously, with a wide-spread unit, his drivers had encountered a considerable amount of difficulty obtaining consistent weights from one axle to the other, so that drivers were sometimes held up at the scales as much as three hours.

Both operators point out that one of the major advantages of the Ravens Tri-Axle design is its sturdy, deep-web Alcoa Aluminum frame, permitting the unit to dump with the tractor at an angle, which could not be done with a frameless trailer. And Ravens' ingenious design, taking full advantage of the strength that can be obtained with Alcoa alloys, has produced a trailer incorporating an exceptionally strong frame with a total weight no greater than that of many frameless models.

Why not look into the possibilities for greater profit in replacing your own dump bodies and trailers with aluminum units? For the names of other operators who have enjoyed benefits comparable to those indicated above, and for your free copies of other Alcoa literature on the subject, just write: Aluminum Company of America, 1779-L Alcoa Building, Pittsburgh 19, Pa.

Proof! Aluminum is tougher than steel!

Dump bodies built of Alcoa Aluminum can take three times as much impact as steel—at half the weight!



ALCOA ALUMINUM

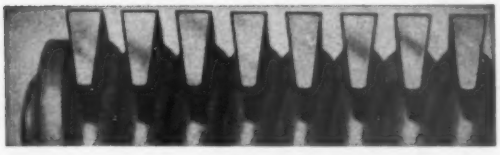
ALUMINUM COMPANY OF AMERICA

HOW TO SELECT DEWATERING SCREENS THAT FIT YOUR REQUIREMENTS EXACTLY

How to select Perforated Plate

Let Hendrick suggest the analysis of H Quality Steel that will stand up longest under your operating conditions. Eliminate blinding with a Hendrick screen that provides full clearance. Get continued product uniformity from the accurate, uniform mesh of a Hendrick screen.

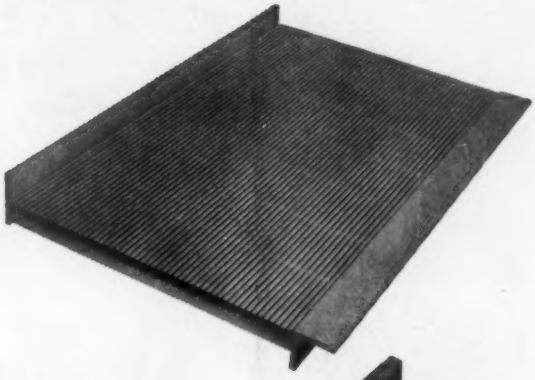
How to select Wedge Wire

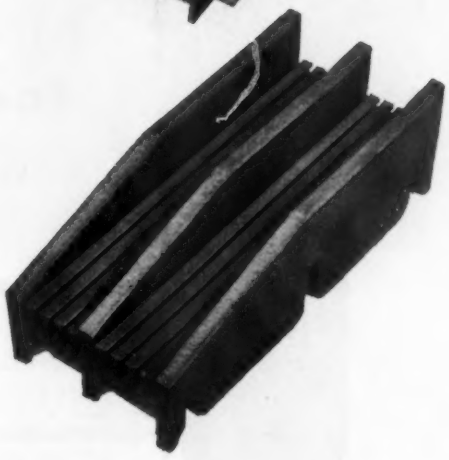


Here are three things to look for: 1) Free clearance—to reduce chances of clogging and blinding. 2) A tapered profile bar, for dewatering efficiency. 3) A deep profile bar, to assure long service life and maximum load-carrying capacity. Get all of these in Hendrick Wedge Wire. There is a type to suit your operating conditions and your needs—whether you want good screening efficiency, good dewatering efficiency, or high resistance to abrasion.

How to select Wedge Slot Screens

For more efficient processing, look for accurately spaced, uninterrupted slots. For heavy-duty service, look for thick, parallel head flanges that maintain uniformity of openings. To prevent abrasion by large chunks, specify Skid Bars. Hendrick offers all of these—*plus* 8 different profile bars. Hendrick will gladly help you select the type that will stand up best under your operating conditions.





Hendrick

MANUFACTURING COMPANY

Headquarters for All Your Screening Needs

30 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring – Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Hendrick Manufacturing Co.
30 Dundaff Street, Carbondale, Pa.

Please send me your catalog on:

- ☐ H Quality Steel Perforated Plate
- ☐ Wedge Slot Screens
- ☐ Wedge Wire

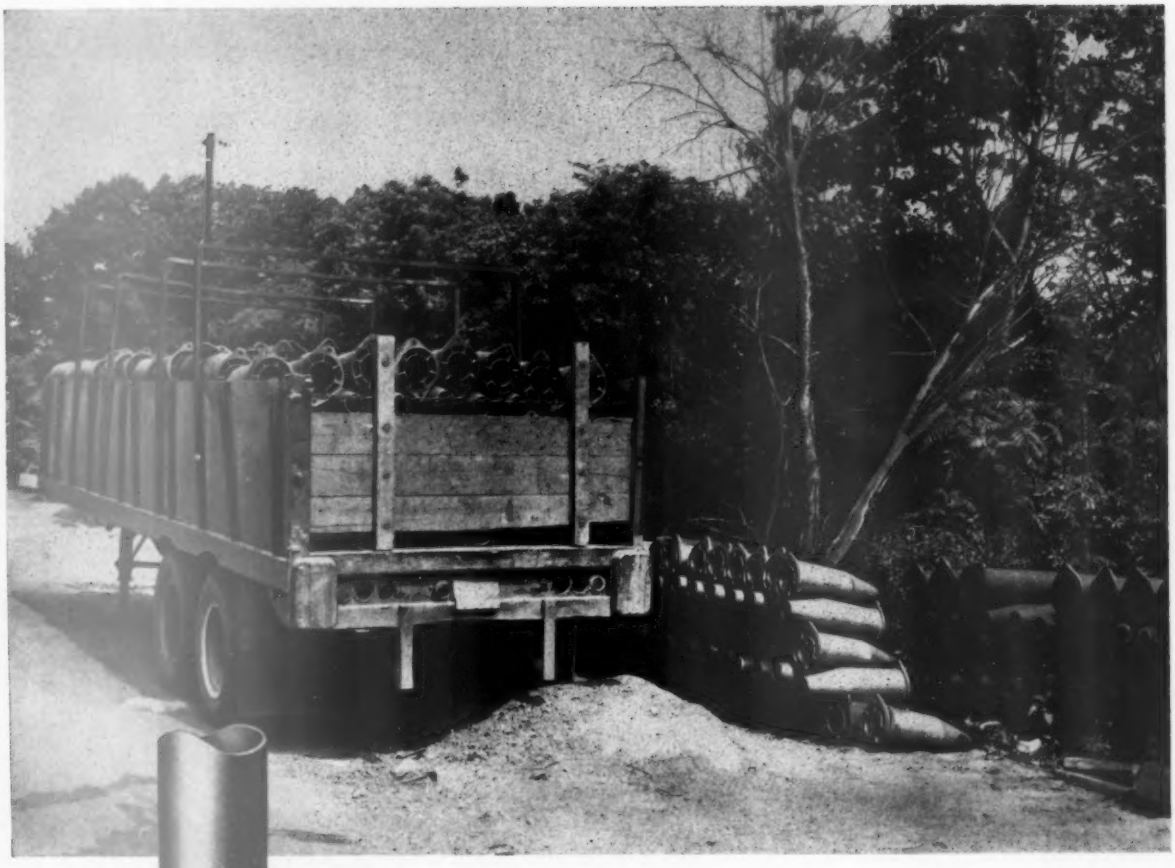
☐ I would appreciate a call from a Hendrick Sales Engineer.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____



TYPE
C10
CYCLO-TRELL

Ammunition for the war on dust!

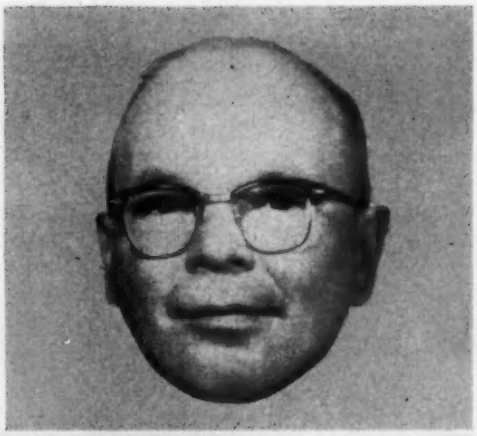
Fighting dust is the purpose of this load of Cyclo-trell C10 "shells." ■ Cyclo-trell units for process gas or air cleaning in steel mills, refineries, paper, cement or chemical plants give you high efficiencies. ■ Engineered to fit each specific job, Cyclo-trell units are available in a wide range of sizes and types including C10, C24, IC (Involute Cyclo-trell) and ICL (Involute Cyclo-trell, Lined). ■ Why not let us consult with you on your specific dust collection problems? For further information, write for Bulletin 300 which describes several applications in detail.

Research-Cottrell

RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, N. J.
Representatives in principal cities of U.S. and Canada

RESEARCH COTTRELL INC.
TRADE MARK
RC-209

"Put SECO to work on your toughest screening job!"



Says Mr. GUY COOLIDGE
Superintendent, Putnam-Hawley
Building Materials, Inc., Potsdam, N. Y.

"We did, and we are not only sold on the increased production results, but with the low maintenance factor as well.

Our graded production runs a full 170 T.P.H. in five rigid classifications; three finished gravel grades plus mason and concrete sand . . . And on all five, we're meeting specs of the New York State Highway Department.

Even the wire cloth lasts longer . . . We've had fewer changes than ever before. But when replacement is necessary, downtime is at a new low with SECO's fast-securing method."

Mr. Coolidge's enthusiasm is shared by hundreds of other profit-wise aggregate producers from coast to coast. They are sold on the SECO TWIN-BEARING screen's year round productivity potential and day-in, day-out operating dependability.

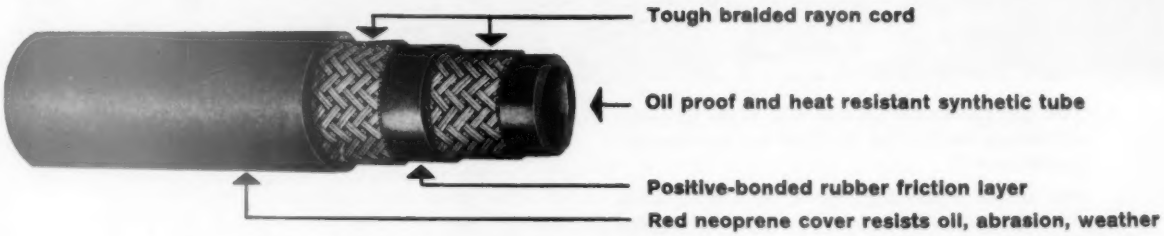
You will be, too. Make your next vibrating screen investment a profitable one . . . make it SECO TWIN BEARING.

REQUEST SECO BOOKLET TB-21

SCREEN EQUIPMENT CO. Inc.
BUFFALO 25, NEW YORK

SECO
"TIME CONSCIOUS" VIBRATING SCREENS

The hose that wears like a truck tire!


Tough braided rayon cord
Oil proof and heat resistant synthetic tube
Positive-bonded rubber friction layer
Red neoprene cover resists oil, abrasion, weather

Work like this is rough on hose, but Thermoid-Quaker "Versicon" takes it in stride. "Versicon" hose is built for high air pressures, up to 300 psi. It's built to withstand dragging over jagged, abrasive rock. It resists oil, baking sun or freezing cold. It's the heavy gauge, tough neoprene cover that takes this kind of surface abuse.

The tough braided rayon reinforcement gives it the extra strength to withstand high working pressures.

The tube is a specially compounded synthetic that's oil proof, heat resistant and will not flake or chip.

"Versicon" is made in all sizes up to 1½" and in lengths up to 500′ in some sizes. Also in one, two or three braid constructions for use with water, oil, grease, solvents, sprays and mild chemical solutions.

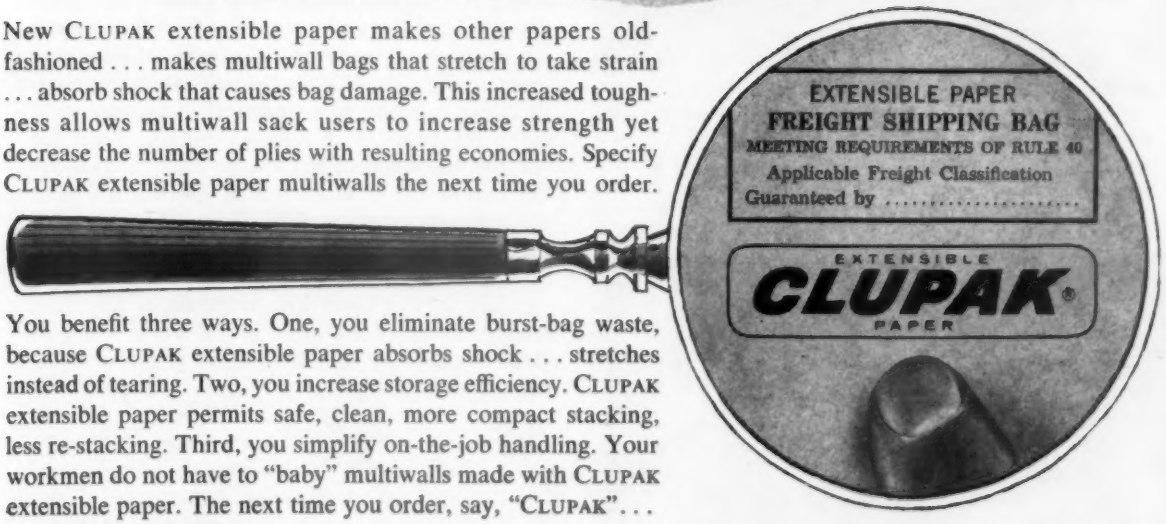
See your experienced Thermoid Division Distributor for the right hose for your requirements, or write: *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, N. J.*

THERMOID DIVISION PORTER **H.K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

ELEMENTARY...IT'S A EXTENSIBLE CLUPAK® PAPER* MULTIWALL BAG ...THAT'S WHY IT DIDN'T BREAK!

New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.



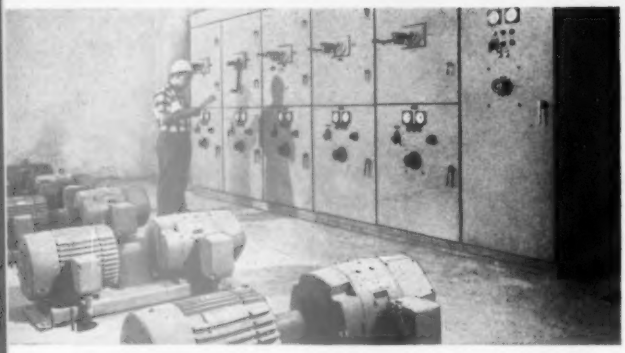
You benefit three ways. One, you eliminate burst-bag waste, because CLUPAK extensible paper absorbs shock . . . stretches instead of tearing. Two, you increase storage efficiency. CLUPAK extensible paper permits safe, clean, more compact stacking, less re-stacking. Third, you simplify on-the-job handling. Your workmen do not have to "baby" multiwalls made with CLUPAK extensible paper. The next time you order, say, "CLUPAK"... before you say paper.

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

Dundee Cement Company . . .

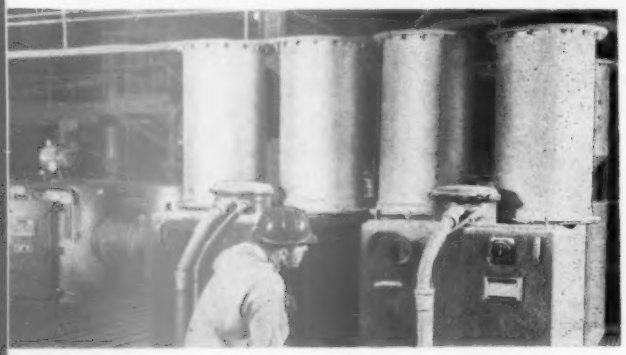
NATION'S MOST HIGHLY MECHANIZED CEMENT PLANT, POWERED BY GENERAL ELECTRIC

Modern in every respect . . . Dundee selects General Electric to power unparalleled initial production of 6 million barrels annually.



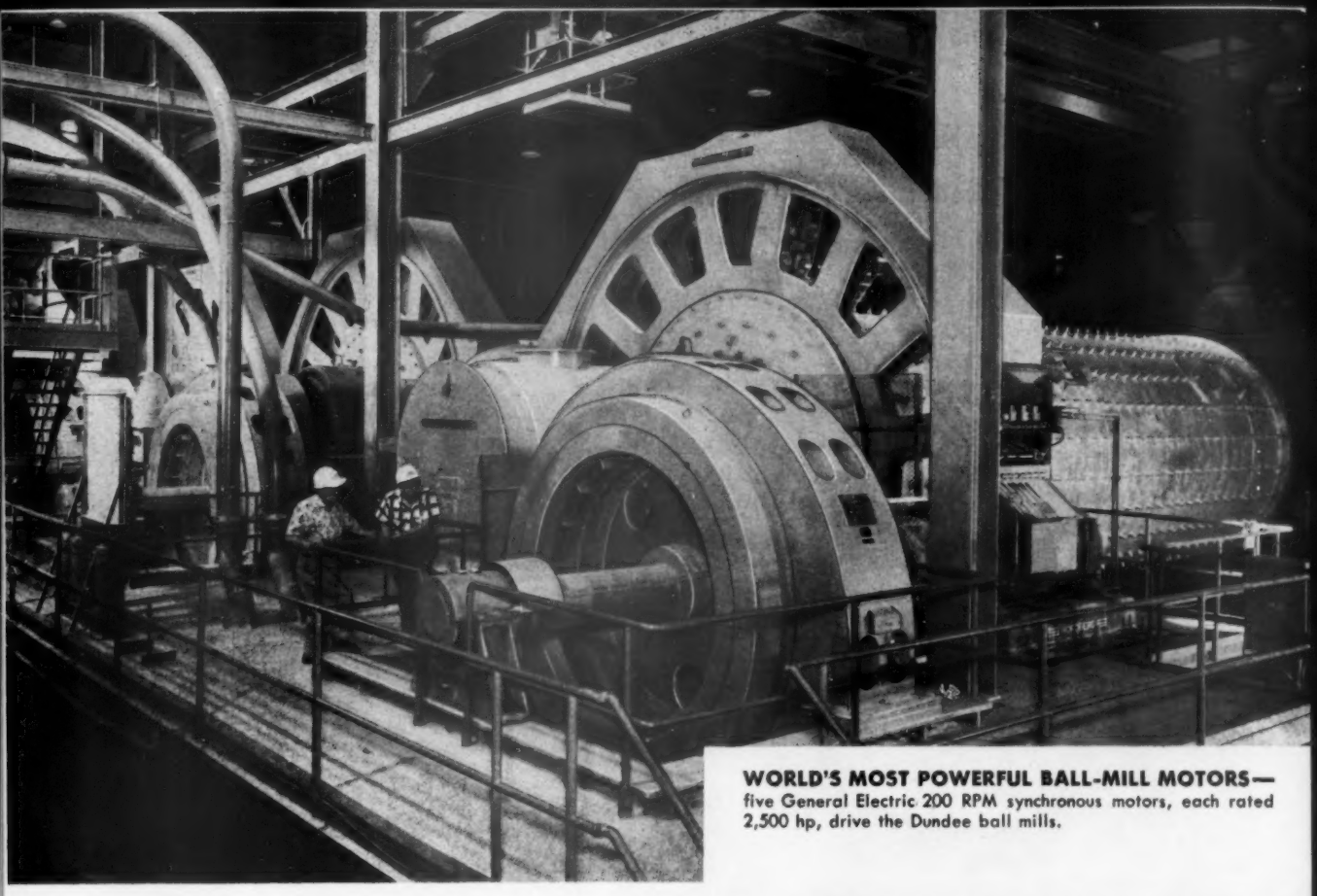
BEHIND-THE-SCENES—G-E Limitamp* equipment consisting of isolator switches, spotting panel and field control panels, supports the five 2,500-hp raw and finish grinding mill motors.

NO DUST PROBLEMS—dust control means increased profits, happy neighbors. General Electric high-voltage silicon rectifier power supply is a vital link in the operation of Dundee's electrostatic dust precipitators.



Planned and built to meet the needs of a present—and expanding—cement market, Dundee Cement Company's new plant at Dundee, Mich., has received the attention of leaders in the cement industry throughout the world. And well it might. For Dundee Cement enjoys the enviable distinction of being able to more than double its initial production capacity of 6 million barrels per year, at any point in time, without enlarging plant structures. It's no "secret" that thorough planning resulted in a practical and economical plant layout . . . this saves dollars. Built for volume, the $25 million Dundee plant also enjoys the distinction of being one of the world's most economically constructed cement plants . . . slightly less than $5 per barrel construction cost.

Small wonder then that, in planning the most modern plant of its kind in the world—largest start-up capacity, world's largest grinding mills, largest kilns on this continent, Dundee's designers looked to General Electric to provide reliable power vitally necessary for such a highly mechanized facility. Working in cooperation with Dundee and the engineering department of the St. Lawrence Cement Co., Clarkson, Ontario, General Electric supplied apparatus including switchgear, motor control centers, 5 of the most



WORLD'S MOST POWERFUL BALL-MILL MOTORS— five General Electric 200 RPM synchronous motors, each rated 2,500 hp, drive the Dundee ball mills.

powerful ball-mill motors in the world, each rated 2,500 hp, and more than 250 induction and other motors ranging up to 800 horsepower—all to provide integrated and reliable power, from quarry to storage silos.

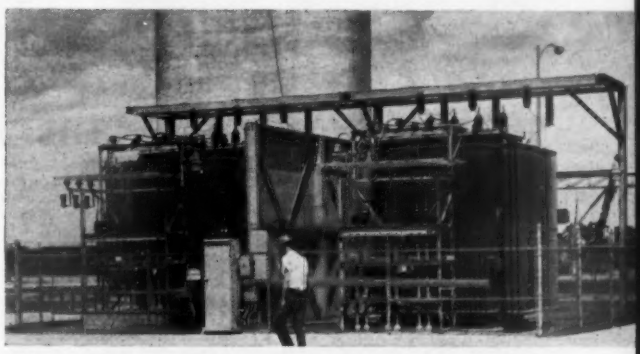
Dundee Cement and other leading producers of Portland Cement in the United States look to General Electric for the electrical apparatus systems so necessary in this age of highly mechanized cement production.

If you are planning to expand or modernize existing facilities, or to build new processing plants . . . you'll be dollars ahead to call on General Electric. Experienced G-E application engineers—familiar with electrical requirements of the cement industry—will gladly assist you or your engineering consultants in providing the electrical systems tailored to meet your own specific needs. For immediate information, call your nearest General Electric Sales Engineer, or write direct to General Electric Company, Section 658-25, Schenectady 5, New York.

*Registered Trade-mark of General Electric Co.

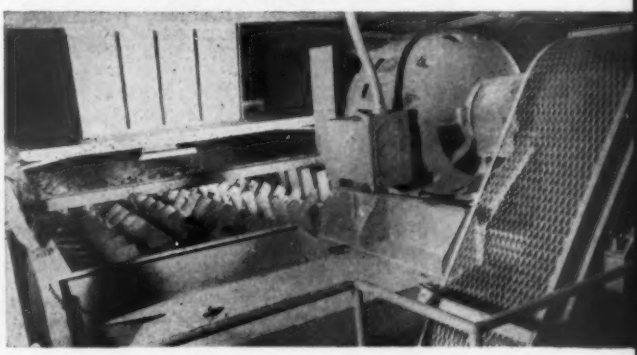
Progress Is Our Most Important Product

GENERAL ELECTRIC



INCOMING POWER—Detroit Edison generated power enters Dundee through these G-E substation transformers supplying 4800-volt, 3-phase, 60-cycle power to plant operations.

RUGGED DUTY REQUIRED HERE—years of reliable trouble-free operation of this clay preparation log washer is assured, thanks to the 600-hp G-E squirrel-cage motor.



Enter 188 on card, page 197

Accurate to one ten thousandth of one percent. With this new "Direct Reader" Spectrograph, CF&I maintains extraordinary control over each melt of steel. Samples, taken from the blast furnace or open hearth, are sped to the lab via pneumatic tubes. In minutes, a complete spectrographic analysis is ready. This "controlled chemistry" means Grinding Balls and Rods that wear longer, grind more efficiently.

What CONTROLLED CHEMISTRY means in CF&I Grinding Balls and Rods

CF&I takes great care in the selection of steels used in its grinding balls and rods. For example, each size ball from the smallest to the largest (¾" to 5" diameter) must have the proper composition to give the best balance between hardness and toughness. CF&I's modern spectrographic equipment assures you balls with the correct chemistry in relation to their size. In fact, CF&I uses different steels, depending on the ball size required. This chemical control pays off in your mill because CF&I balls have greater resistance to abrasion, withstand impact, and grind at lower cost.

In grinding rods, CF&I observes similar standards. Special analyses of high carbon steels are hot-rolled and machine-straightened to close tolerances, from 1½" to 4" diameter in whatever lengths ordered. CF&I's controlled chemistry techniques result in grinding rods that have excellent wearing properties, resisting bending or premature breakage.

For the complete story on the advantages of CF&I Grinding Balls and Rods, get in touch with your local CF&I Sales Office.

OTHER CF&I STEEL PRODUCTS FOR THE CEMENT INDUSTRY
CF&I Mine Rail and Accessories • CF&I Rock Bolts and Relock Metallic Fabric
CF&I Industrial Screens • CF&I-Wickwire Wire Rope • CF&I Grader Blades

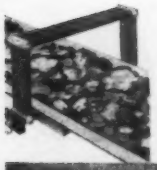
CF&I STEEL

MINING PRODUCTS

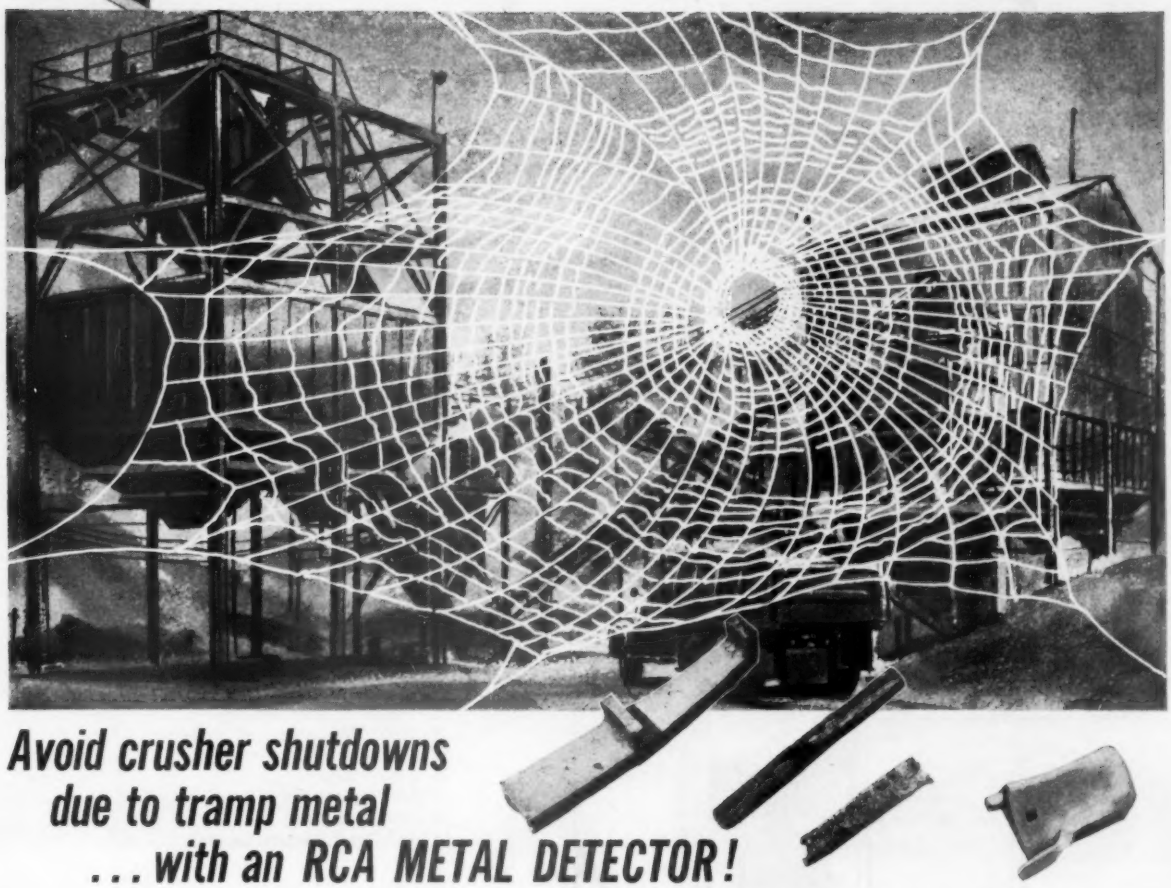
THE COLORADO FUEL AND IRON CORPORATION

7525-B

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Leandro • Seattle • Spokane • Wichita
In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia



...GATEWAY TO SAFETY FROM TRAMP METAL



Avoid crusher shutdowns due to tramp metal ... with an RCA METAL DETECTOR!

Shutdowns caused by tramp metal—steel bolts, rods, hand tools, dipper tooth fragments—can be virtually eliminated once you install an RCA Electronic Metal Detector. As one well-known producer of crushed stone writes: "*The RCA Metal Detector has cut down-time to the absolute minimum and this means that we save on both parts and labor.* It does a good, thorough job."

The RCA Metal Detector is designed to withstand heavy-duty service, dust and moisture. Available in a wide range of sizes, it is easily and quickly installed over existing conveyor lines. Rugged components and built-in voltage regulator provide efficient, trouble-free operation. Both magnetic and non-magnetic metals are readily detected. As the material passes through the aperture, the presence of tramp metal triggers the Metal Detector, which can be set up to stop the conveyor, or actuate a horn or reject mechanism.

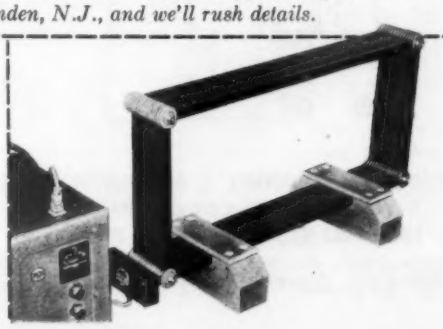
The RCA Service Company will provide installation supervision and service if desired.

Find out more about the RCA Electronic Metal Detector and how it can save you money. Write to RCA, Dept. N-236, Building 15-1, Camden, N.J., and we'll rush details.

RCA

The Most Trusted Name in Electronics

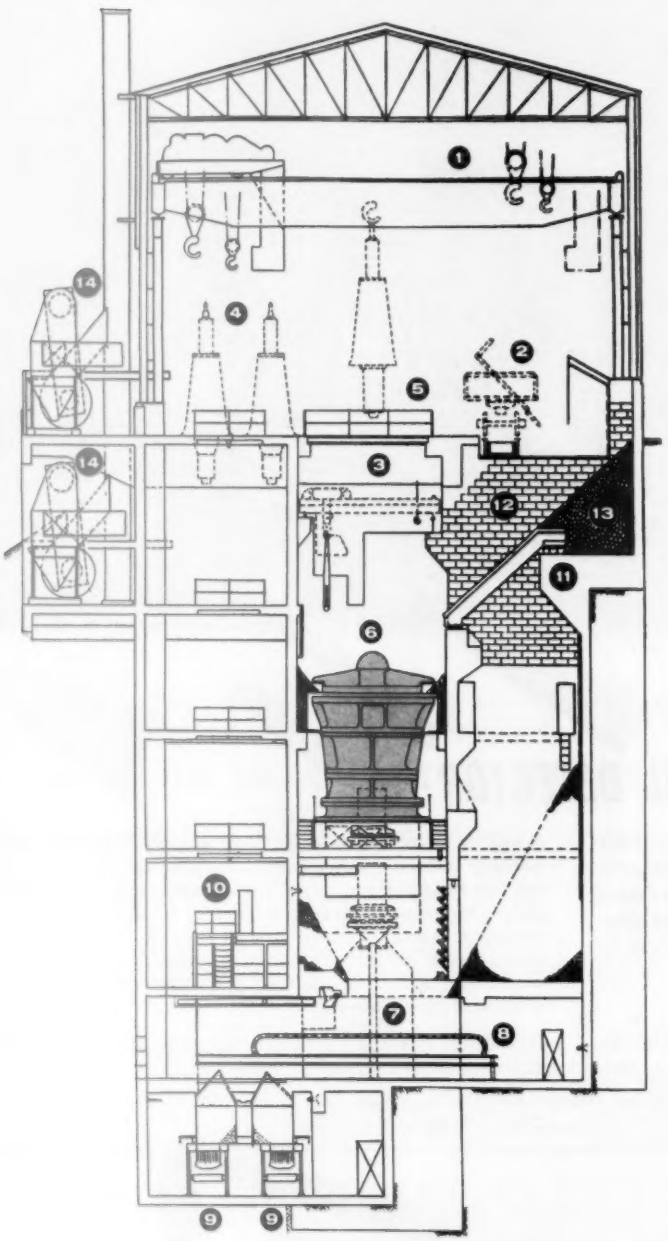
RADIO CORPORATION OF AMERICA



RCA ELECTRONIC METAL DETECTOR

1,000,000

POUNDS OF TRAYLOR ENGINEERING!



TRAYLOR

world's largest manufacturer of 60" gyratory crushers designed and built this giant for installation in Peru.

The Southern Peru Copper Corporation called on Traylor-made ECONOMY, EFFICIENCY, AND CAPACITY to handle the tremendous crushing workload at its new plant in Toquepala, Peru.

Drawing shows Traylor 60" gyratory crusher operation:

1. 100-ton crane with 25-ton auxiliary hook and operator's cab
2. 43-cu. yd. side-dump mine car
3. 20-ton crane with rock hook
4. Mantle storage
5. 18 x 22-ft. removable hatch
6. 60-in. Traylor gyratory primary crusher
7. Hydraulic hoist, 14-ft. lift, 25-ton capacity
8. Two 72-in. pan feeders
9. Two 54-in. chain-belt conveyors
10. Electrical control panel
11. 8-in. grizzly
12. 2-in. plate liners
13. Dead-bed areas
14. Air filter dust removal unit

Other Traylor Crushers made for primary, secondary or fine reductions. Write today outlining your crushing requirements and let Traylor's engineers make recommendations . . . or ask for Bulletin No. 1126.

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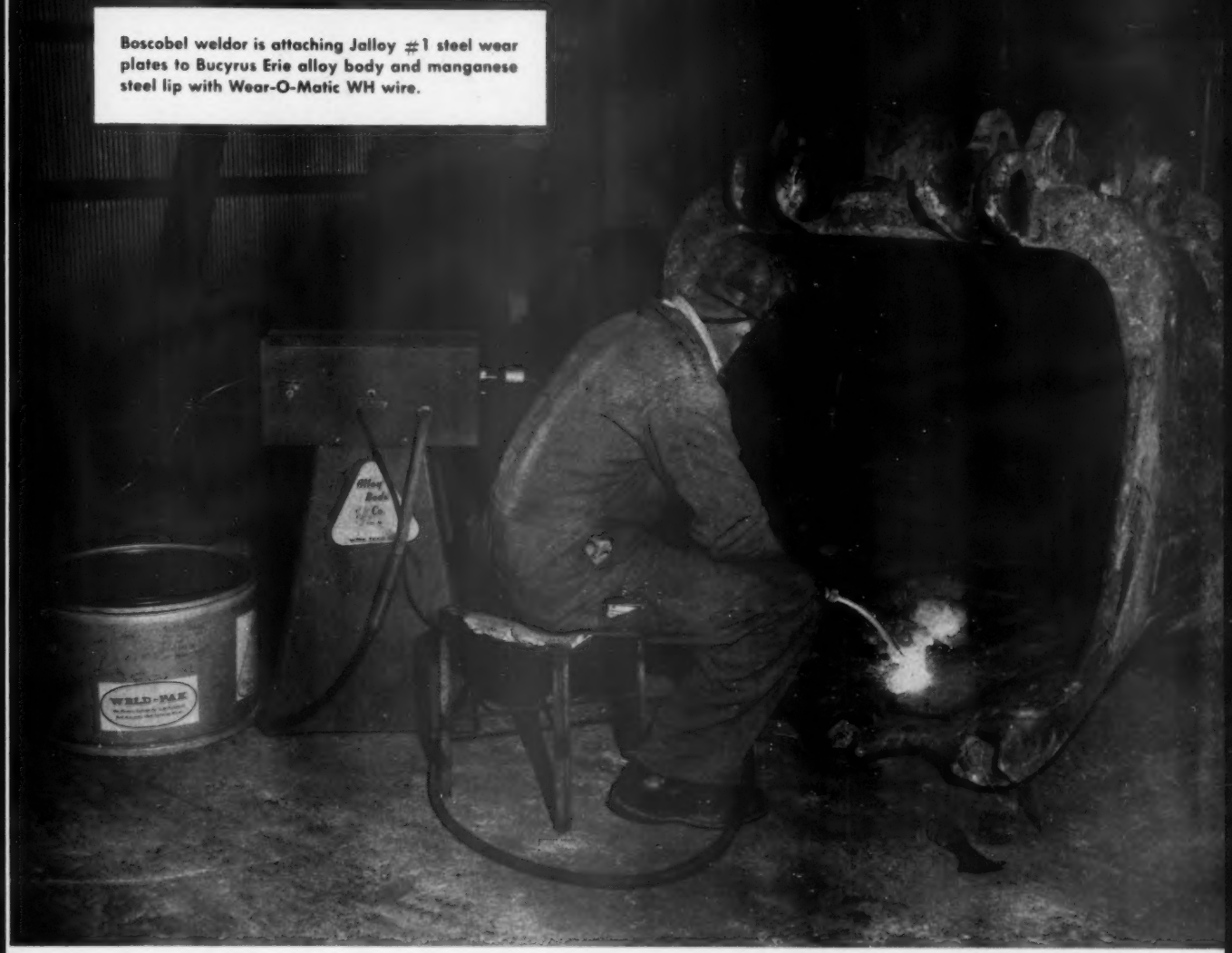
DIVISION OF FULLER COMPANY
1556 MILL ST., ALLENTOWN, PA.
Sales Offices: New York, Chicago, San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

TCA-9



Boscobel weldor is attaching Jalloy #1 steel wear plates to Bucyrus Erie alloy body and manganese steel lip with Wear-O-Matic WH wire.

35% Savings on bucket maintenance with NEW Wear-O-Matic WH welding wires

"Wear-O-Matic WH is the most versatile welding wire for bucket maintenance because it provides high strength welds in any of the popular alloy steels and has excellent resistance to impact when used for build-up work. Savings in time and labor through the semi-automatic open arc application of this wire have resulted in less bucket down time and lower costs."

L. ARDEN HENLEY, SUPT.
BOSCOBEL GRANITE CORP., MANAKIN, VA.

WHAT about bucket maintenance in your shops? Costs too high due to too many manual welding applications? The important benefit gained by Boscobel Granite was the elimination of manual welding with stainless steel electrodes to obtain the necessary high strength attachment welds for their rugged rock handling chores. These benefits can be yours whether you are welding manganese to manganese, manganese to carbon steel or either of these to any of the abrasion or impact resistance alloy steels. Then, without changing wires, your weldor can apply build-up deposits to lesser worn areas such as latch pins, keepers and lips . . . a deposit that will work harden to outwear manganese steel. To put more service life in the business end of your shovels and drag lines, investigate today the semi-automatic open arc application of Wear-O-Matic WH wires. You'll lower your maintenance costs . . . decrease down time and increase working life. For complete details, request Bulletin AR-21. Alloy Rods Company, P. O. Box 1828, York 32, Pa.

ALLOY RODS COMPANY

YORK, PENNSYLVANIA

SALES OFFICES & WAREHOUSES; BOSTON, NEWARK, PHILADELPHIA, PITTSBURGH, BIRMINGHAM, CHICAGO, SAN FRANCISCO & EL SEGUNDO, CALIF.—DISTRIBUTORS IN ALL OTHER PRINCIPAL CITIES

TWENTY YEARS OF LEADERSHIP IN THE DEVELOPMENT OF QUALITY ALLOY ARC WELDING ELECTRODES

For SPEED and SAVINGS

The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends.

The combination of NAYLOR Spiralweld pipe and Wedgelock couplings provides a practical guide to save time and work in pipe line construction for mining service.

NAYLOR pipe is easier to handle and install because it is light in weight. And you get this light weight without sacrifice of strength, due to the lockseamed-spiralwelded structure that makes this pipe distinctive.

NAYLOR Wedgelock couplings further contribute to savings by simplifying and speeding connections. A hammer is the only tool required to connect or disconnect them.

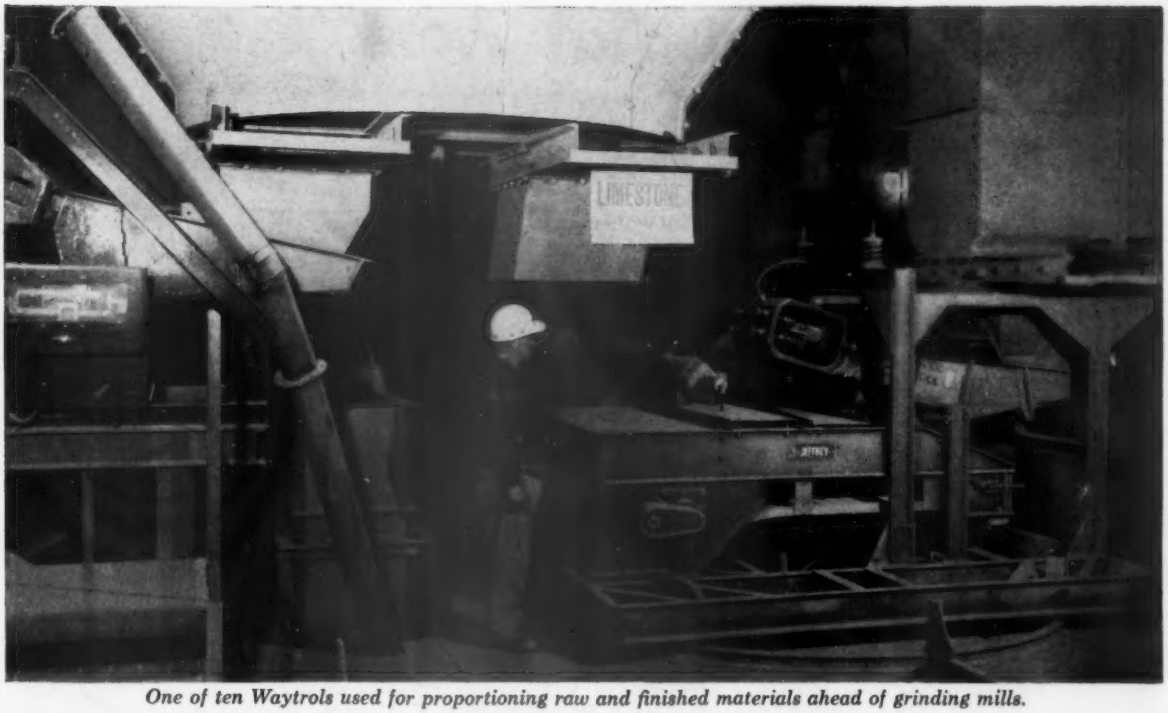
It will pay you to use this proved pattern for your air, water, tailings and ventilating lines.

Write for Bulletin No. 59.

NAYLOR PIPE *Company*

1257 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.



One of ten Waytrols used for proportioning raw and finished materials ahead of grinding mills.

One of twelve Jeffrey 6D Feeders handling raw materials at rates up to 650 tons per hour.

JEFFREY WAYTROLS CHOSEN FOR NEW CEMENT PLANT

Modern facilities assure efficient operation for producing quality cement at Dundee Cement Company's plant at Dundee, Michigan.

All materials are handled by Jeffrey vibrating feeders, from crushers, track hoppers, storage piles and silos ahead of the Jeffrey Waytrols. Raw and finished materials are proportioned by the Waytrols.

Jeffrey is proud to have had a part in this most modern plant for efficient cement production.

The Jeffrey Manufacturing Company,
917 North Fourth Street, Columbus 16, Ohio.

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TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

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(O)—a famous symbol of dependable quality in many packaging fields . . . glass and plastic containers, corrugated boxes, and multiwall bags.

Lambert Hitchcock was the first large-scale manufacturer of furniture in America. The skill and quality which went into his designs have lived for 150 years, as is represented by the famous "Hitchcock Chair."

Think of the maker when you buy any product . . .

It pays to buy bags from a packaging specialist!

So much more than just the ability to produce it must be considered when you buy any manufacturer's product. It must be backed by experience, to assure you that the product is properly designed to fit its specific uses . . . by dependability to assure you of exactly what you want, when and where you want it . . . and, of course, by quality.

Owens-Illinois, through its leadership in many fields of packaging, can help you in all your multiwall bag requirements—the *right* multiwall bag for every packing, handling, storage, and shipping method.

For full information,
write to Owens-Illinois,
Multiwall Bag Division,
Toledo 1, Ohio

MULTIWALL BAGS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

CAR HANDLING SYSTEMS for loading such material as rock and gravel in railroad cars are described in Bulletin 760, released by *McNally Pittsburg Mfg. Corp.* Photographs, drawings, and specifications describe automatic loading systems, car hauls, and car retarders. (301)

A HEAVY-DUTY, SOLIDS-HANDLING PUMP, the Coyne 400V, is depicted in a folder available from *Coyne Pump Company.* The balanced dual volute virtually eliminates radial shaft loading and blends the flow in the discharge nozzle. The pump can be mounted adjacent to a sump, or can be submerged, for the handling of slurries, and for circulating systems, feeding cyclones, and disposal pumping in cement mills. (302)

"TYPE B SCREW CONVEYOR DRIVE," *Link-Belt Company's* new standard double reduction shaft-mounted speed reducer drive for direct application to screw conveyors is described in 4-page Folder 2718. The speed reducer is available in 6 sizes with ratios of 15:1, 20:1, and 24:1 for motors up to 30 hp. The drive has a built-in baffle system to prevent oil reaching material in conveyor, and vice-versa. (303)

NEW DISTRIBUTION PANELBOARDS with enclosed magnetic starters are described in detail in *General Electric* Bulletin GEA-6728. The new line is designed to replace hodge podge wall-mounted installations of separate devices. The equipment is rated v. a. c. maximum. Magnetic starters are used in N.E.M.A. sizes #0 through #3, with 50-hp. maximum rating. (304)

THE GYRADISC CRUSHER for use in the production of large tonnages of extremely fine products is described in a bulletin published by the *Nordberg Mfg. Co.* Comminution, a process by which a thick mass of material is alternately impacted and released, is explained, as is the feed arrangement which assures thorough mixing. (305)

CAPABILITIES OF THEW-LORAIN units manufactured by *The Thew Shovel Company* are outlined in a series of bulletins published by the company. Profusely illustrated, each booklet gives the specifications and accessories for the unit discussed.

Lorain 26 heavy-duty ¾ cu. yd.—turntable, crawler, crane boom, clamshell, dragline, hoe boom, shovel boom. Bulletin #26751-0.

47-ton Lorain 820A, 2 cu. yd.—shovel, crane, dragline, clamshell, hoe. Bulletin #36753-0.

60-ton Lorain 8x4 Motor-Crane MC-760 with "power-set" outriggers — Moto-Crane carrier, turntable, crane-clamshell. Bulletin #56761-0.

25-ton, 1-cu. yd Lorain 50, a crawler-mounted shovel crane—shovel, crane, hoe, clamshell, dragline. Bulletin #467-58-0.

Specify which bulletins you require in your request. (306)

AN EXPLOSIVES-MIXING PLANT ON WHEELS, the PE-6 ammonium nitrate transporter body manufactured by the *Baughman Manufacturing Company,* is described in Bulletin A-438. The built-in body mixer pre-measures the inactive material, and adds explosive oil to the nitrate as the body is unloaded. The units can be supplied with either p.t.o. or auxiliary engine drives, and mounted on truck of trailer. (307)

A NEW PORTABLE MOTOR TRUCK SCALE manufactured by *Toledo Scale Corporation* is presented in a 4-page brochure. Desired platform length and capacity is achieved by bolting self-contained units together. The special link suspension protects pivots and bearings. Several types of weight indication are offered—dial, type registering beam, and the Printweigh "400" which provides instant printed records as well as visual indication. Many platform sizes and capacities are available. (308)

BELT LACING EQUIPMENT and materials available from the *Clipper Belt Lacer Company* are depicted in a pocket-size folder. Descriptions and prices are given for belt hooks, lacers, and cutters. Information about special purpose belt hooks of stainless steel, Monel, and phosphor bronze is also provided. Lacer models range from a rugged speed lacer, to portable lacers, to vise lacers. A new conveyor belt lacer is also shown. (309)

POWER TRANSMISSION EQUIPMENT AND CONVEYOR supplies manufactured

NOVEMBER **PIT AND QUARRY** **1960**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

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by the *Rockwood Pulley Manufacturing Company* are described in new, 68-page catalog #103B. Perforated open-end belting; Super 358 V-belt drives; gearmotors; fan-cooled speed reducers; chain drives; and conveyor pulleys are among the items listed. Prices, specifications, and engineering data are included. **(310)**

STEEL GRATING AND TREADS for use in cement plants are tabulated and described in a 12-page brochure published by *Kerrigan Iron Works Company.* **(311)**

BUCKET-CONTROLLED DRAGLINE DIGGING is offered by the *Page Engineering Company's* new dual-hitch automatic dragline bucket, described in a folder offered by the company. The advantages of the bucket are said to include such design features as the forward arch of the unit, hinged corners, and reversible tooth points, all resulting in increased payload. **(312)**

THE ENGINEER'S VEST-POCKET BOOK, under 12 general headings including mathematics, mechanics, heat, electricity, surveying, and mining, offers 250 main items indexed alphabetically, and 47 charts and tables listed under a seperate index. Such information as the formula for the binomial theorem, the strength of gear teeth, properties of minerals, and the properties of structural steel is provided. Published by *Ottenheim Publishers, Inc.,* 4805 Nelson Ave., Baltimore 15, Md., 192 pages, 2⅝ x 5½ in., $0.90. **(313)**

MINING TOOLS made by *Kennametal Inc., Mining Tool Division,* are presented in a new 24-page catalog, M-10. New styles of cutter bits include shank styles in the U-7 series, extra strong U16 for boring-type continuous miners, a U-5 series with side shoulders similar to those on Style J2 bits, and heavy-duty U17 series bits with new gage shoulder location. Revisions and rearrangements of specifications have also been made on rotary drill bits, roof bits and augers, auger adapters, core bits, and finger bits. **(314)**

THE WEMCO SAND-SORT, a free-settling, classifying tank for removing excess slimes and water from a sand slurry, and capable of eliminating unwanted size fractions and production of two or more sands of different size gradations, is described in an illustrated folder released by *WEMCO,* a division of *Western Machinery Company.* **(315)**

PROCESSING ALL TYPES OF SOLIDS, including heat-sensitive, abrasive, corrosive, and sticky materials is the function of rotary dryers—straight shell and varying diameter (DehydrO-Mat), calciners, kilns and roasters manufactured by *Edw. Renneburg & Sons Co.* These units, in addition to various furnaces, air pollution control systems, batch dryers, flash dryers, and accessories for all of these are depicted in Bulletin G560. The units process such materials as sand, stone, perlite, and fluorspar. **(316)**

"CONVEYING SYSTEMS," a 16-page bulletin issued by *The DAY Company,* illustrates and explains efficiency gains possible with DAY low-density or high-density conveying systems. **(317)**

THE COMPLETE LINE OF CUTTER BITS made by *Austin Powder Company* is listed in a new bulletin. Applications for nine models in two series are given, and the advantages of each are discussed. **(318)**

TEMPERATURE MEASUREMENT TO 4,000 DEG. F. using a radiation pyrometer in an a.c. bridge circuit is illustrated in 4-page product specification sheet, E51-4, available from the manufacturer, *Bailey Meter Company.* The principle of operation is described and a graph shows high millivolt output versus temperature. **(319)**

"MECHANICAL JOINING OF ALUMINUM," a 32-page handbook published by *Reynolds Metals Company,* explains the use of nails and pins, metal stitching, mechanically formed joints, and architectural fasteners. **(320)**

Material listed here is FREE unless otherwise noted.

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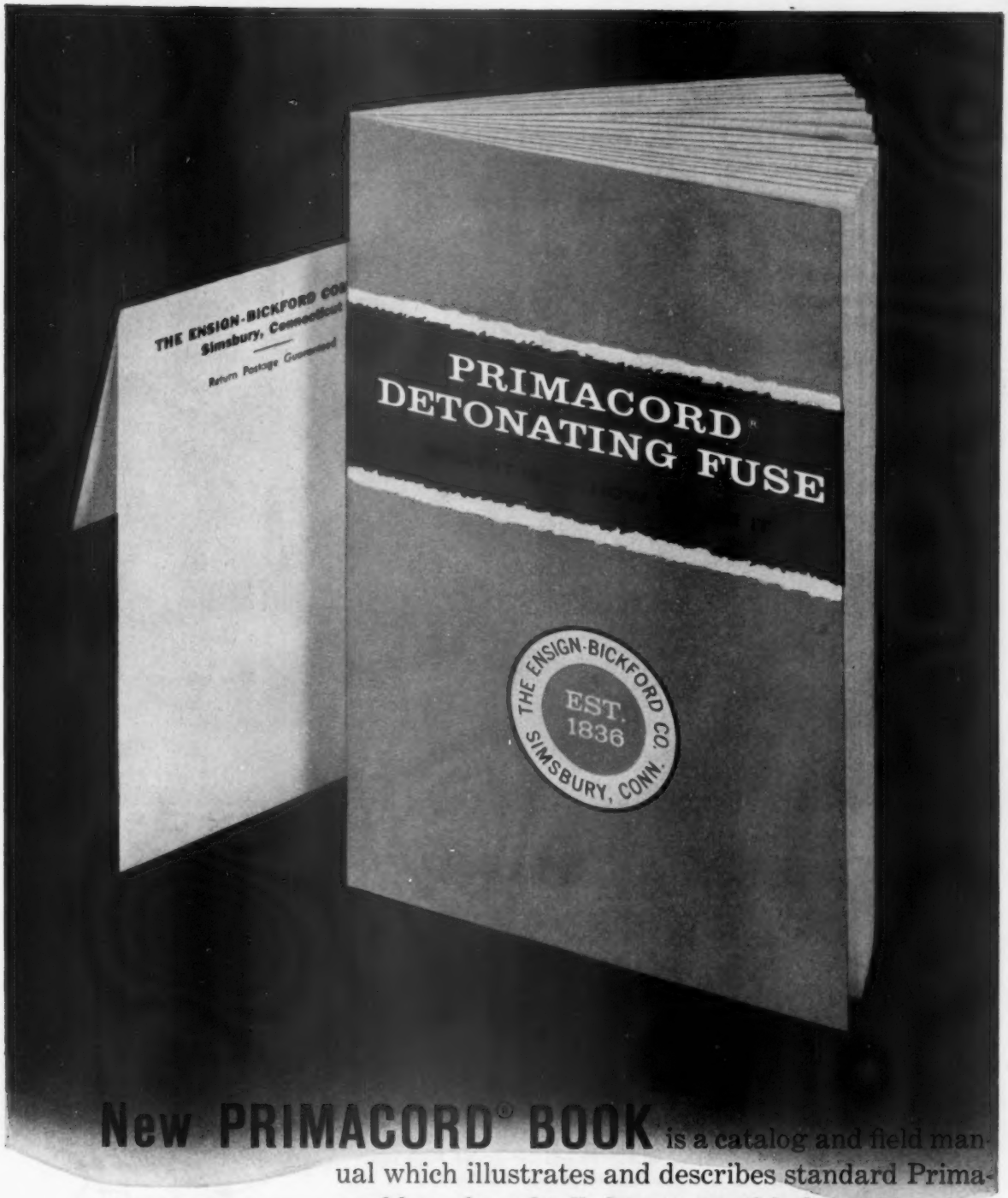


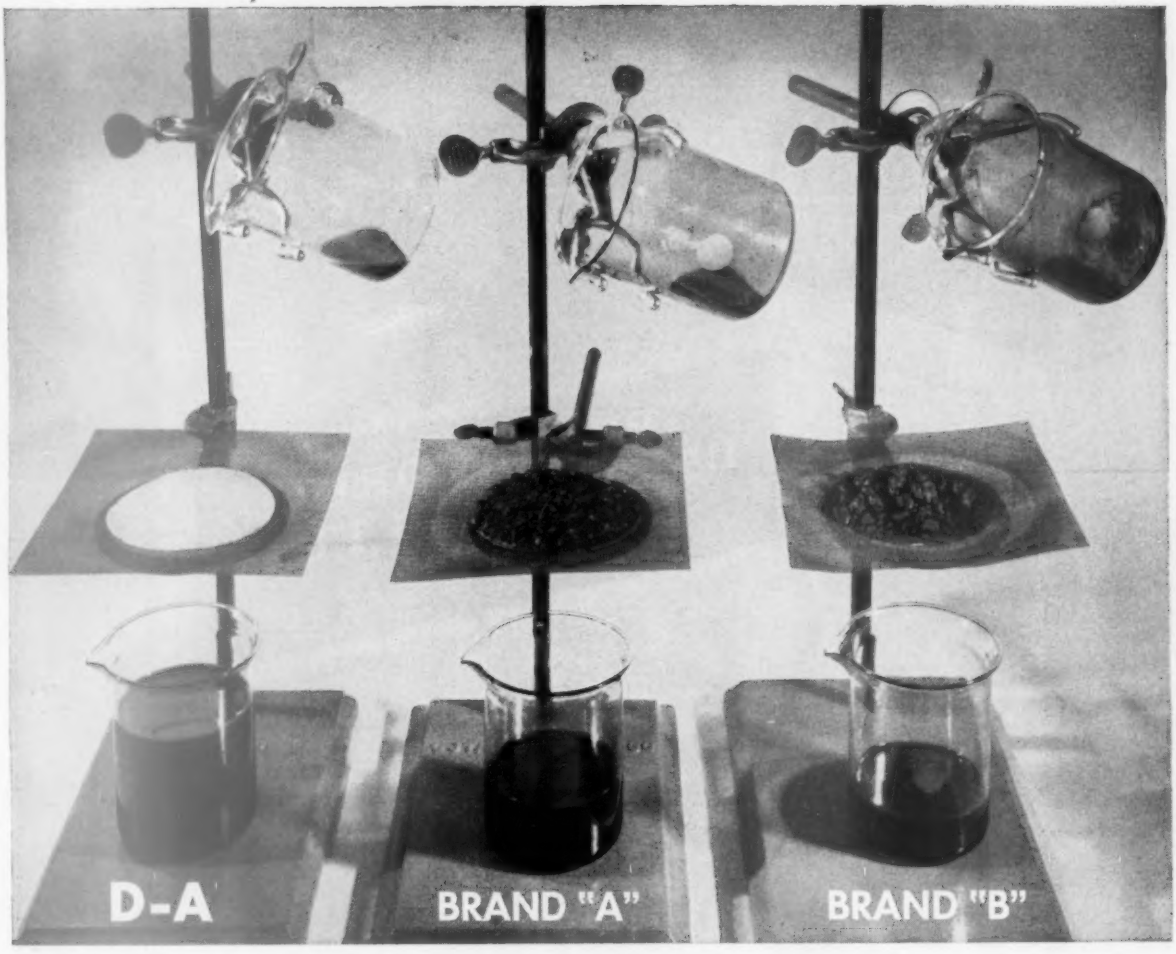
New PRIMACORD® BOOK is a catalog and field manual which illustrates and describes standard Primacord brands and tells how to use this detonating fuse to obtain better blasting with greater safety and profit—in mining, quarrying and construction work.

Ask your explosives supplier for a free copy or write to Sales Department

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut **Since 1836**

P-6



Stop sludge, stop corrosion with D-A UNIVERSAL GEAR LUBE

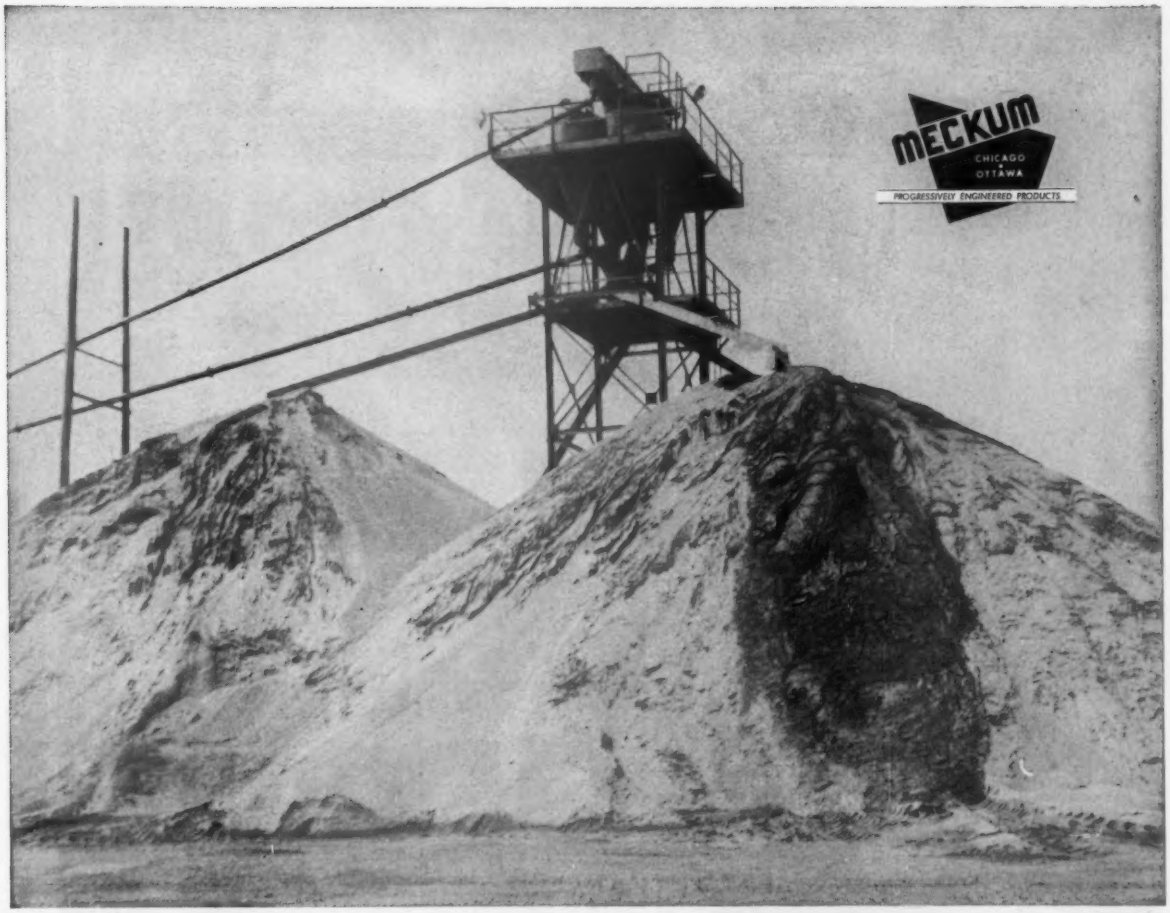
The unretouched photograph above shows the results of a 24-hour accelerated oxidation or sludge test. On the right, two leading brands of gear lube are badly oxidized following the test while, on the left, D-A Universal Gear Lube remains clear, stable and capable of extended use.

Here's what this means to your operation: film strength is the element of a gear oil which prevents wear. To obtain high film strength, extreme pressure additives are placed in the lubricant. At a temperature of about 250° — often encountered in heavy-duty equipment operation — these additives can oxidize, as they have in the competitive oils seen above. When this oxidation occurs, the oils become extremely corrosive and rapid wear results. Tests prove that D-A Universal Gear Lube does not corrode, even at temperatures as high as 300° F.

D-A Universal Gear Lube does not sludge or oxidize under high operating temperatures because D-A research has established successful means of retaining the stability of D-A's high-quality base oil while maintaining the high film strength necessary for extra-heavy-duty equipment operation. For greater protection of *your* equipment under heavy load and high temperature conditions, specify D-A UNIVERSAL GEAR LUBE.

Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.



It's No Secret .. AUTOMATIC SAND PRODUCTION IS HERE

with the MECKUM-FLOATEX SAND MAKING & CLASSIFYING SYSTEM

- EXACTING CLASSIFICATION
- LOW INITIAL INVESTMENT
- AUTOMATIC OPERATION
- MAXIMUM EFFICIENCY
- RETAINS FINES
- FLEXIBILITY
- HIGH CAPACITY
- LOW LABOR COST
- AUTOMATIC BLENDING
- REMOVES CLAY & SILT
- HYDRAULIC CLASSIFICATION

SAVE MONEY ON EVERY TON OF SAND PRODUCED

With the Meckum-Floatex System you get all the advantages of low cost automatic operation with minimum maintenance.

The Meckum-Floatex Sand Making & Classifying System has the proven ability to operate from feed to stockpile by automation, and without such costly operating accessory equipment as screws, drags, wheels, rakes, conveyors, elevators, etc.

Get all the facts today

MECKUM ENGINEERING, INC.

Dayton Road
Ottawa, Illinois

53 W. Jackson Blvd.
Chicago 4, Illinois

MECKUM ENGINEERING, INC.
Dayton Road
Ottawa, Illinois

Please send me the facts on how the Meckum-Floatex Sand Making & Classifying System can make 'spec' sand at rock bottom cost.

I am interested in a_____TPH system.

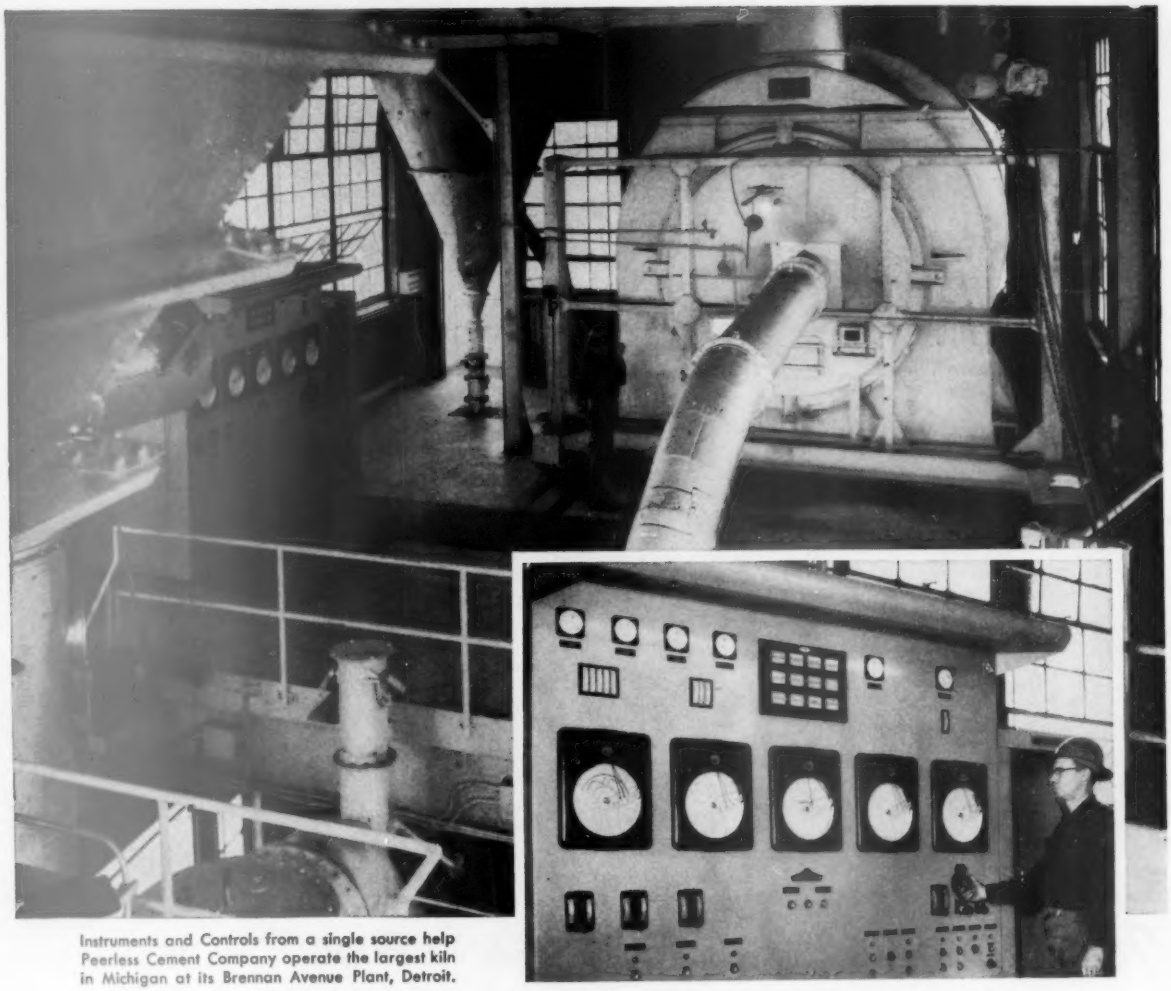
NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

F-2



Instruments and Controls from a single source help Peerless Cement Company operate the largest kiln in Michigan at its Brennan Avenue Plant, Detroit.

This giant kiln gives peak performance longer with Bailey Controls

The Peerless Cement Company of Detroit demands maximum capacity, uniform production and low fuel rate from its largest kiln . . . and Peerless gets it!

They do it with a Bailey Control System that gives them complete control of combustion, clinker cooler, and other kiln variables.

The system keeps continuous chart records of 11 important variables, including temperatures, drafts, air flow, kiln speed, fan speed, % oxygen, and % combustibles.

All this is done so dependably that the kiln often makes week-long runs without being touched.

All recording receivers in the Bailey System are plug-in components—easily removed, regrouped, or replaced to meet changing requirements. Additional records are added simply by plugging in receivers on existing recorder cases. Your Bailey Engineer can help you plan for peak performance — call him or write for your Bailey Kiln Control Folder.

C115-1

BAILEY METER COMPANY

1051 IVANHOE ROAD • CLEVELAND 10, OHIO

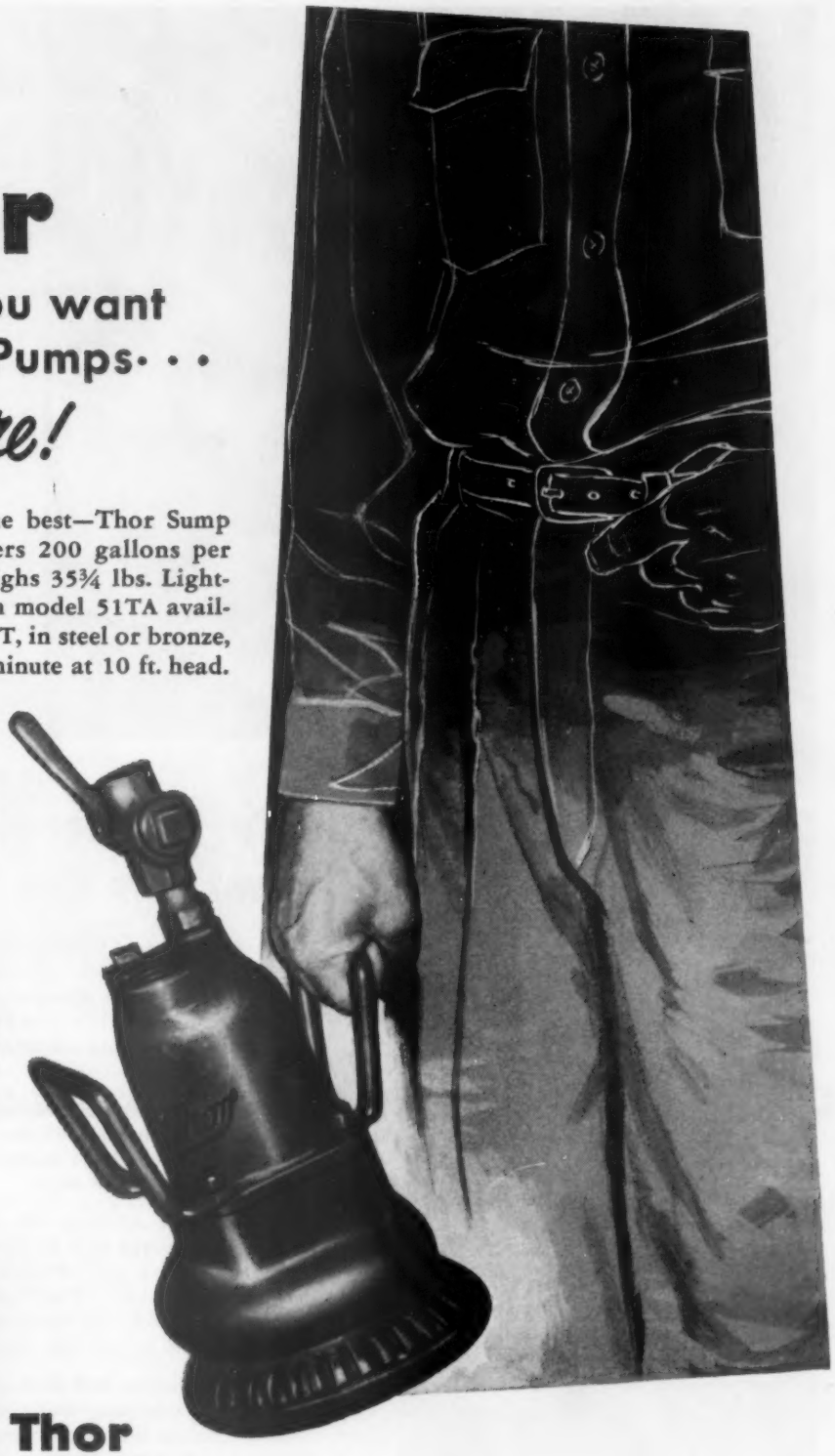
In Canada—Bailey Meter Company Limited, Montreal

Thor

Everything you want in Air Sump Pumps· · ·

and more!

For water removal get the best—Thor Sump Pumps. Model 51T delivers 200 gallons per minute at 10 ft. head. Weighs 35¾ lbs. Lightweight (18 lbs.) aluminum model 51TA available. Heavy duty model 71T, in steel or bronze, delivers 460 gallons per minute at 10 ft. head. Model 381T delivers 125 gallons per minute at 110 ft. Your Thor "Red Tool" distributor will demonstrate. Thor Power Tool Co., Aurora, Ill. Branches in all principal cities.

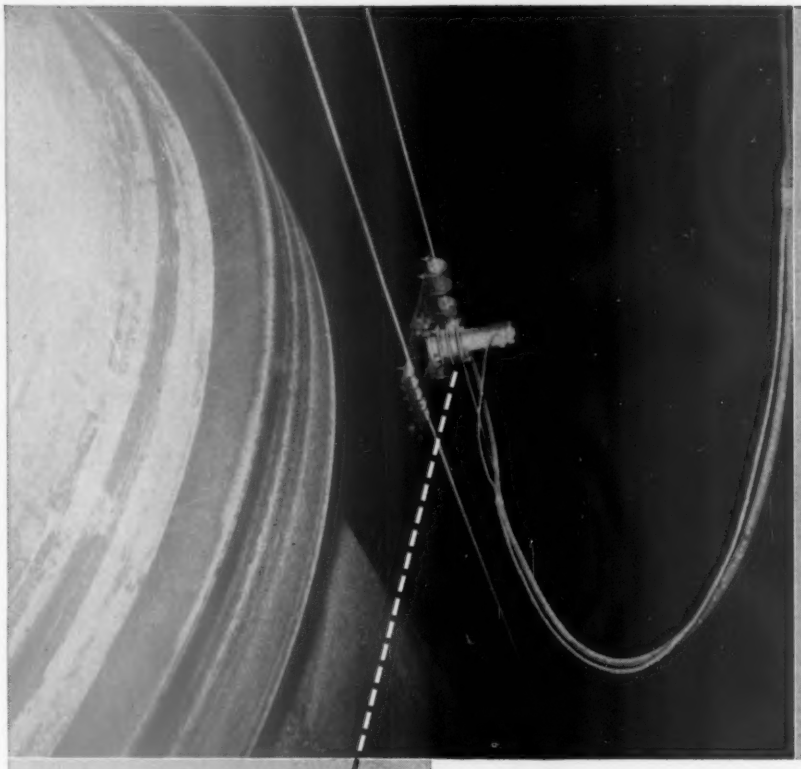


Thor POWER TOOLS

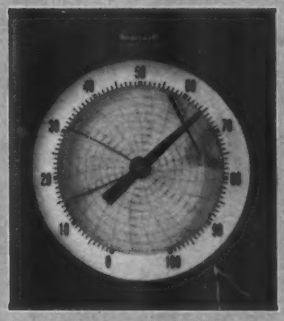
Thor

Everything you want in Air Sludge Pumps . . . *and more!*

Thor Sludge Pump removes water containing sand, rock cuttings—up to 15% solids. Few moving parts, no motor! Delivers 96 gallons per minute at 40 ft. head. Stainless steel working parts, automatic lubrication for long life. Minimum noise.



◀ TRAVELING ALONG KILN SHELL on steel cable, the *Radiamatic* unit provides continuous temperature measurement.



ElectroniK CIRCULAR CHART RECORDER records kiln shell temperatures and reference points showing position of *Radiamatic* along kiln.

RADIAMATIC RADIATION DETECTOR responds to 90 per cent of any temperature change within two seconds, is automatically compensated for ambient temperatures up to 250°F.

Hot Spot Hunter at Universal Atlas Cement cuts Kiln Downtime 70%

A cement kiln is seldom down for refractory replacement at U. S. Steel's Universal Atlas Cement Division, Gary, Indiana. A *Radiamatic* radiation detector continuously and automatically locates potential kiln hot spots before damage can occur – saving costly, time-consuming refractory replacement and production time.

When temperature-sensitive crayons were used to signal hot spots, a tested kiln was down five times in one nine-month period. In the first six months of operation with *Radiamatic* protection, the kiln was down just once.

The *Radiamatic* unit scans kiln shells along the full length of the hot zone, and works with an *ElectroniK* recorder which records both temperatures and reference points showing position of the detector along the kiln. When temperature reaches a preset limit, a signal light warns the burnerman that a potential hot spot is developing, and he can take immediate remedial action.

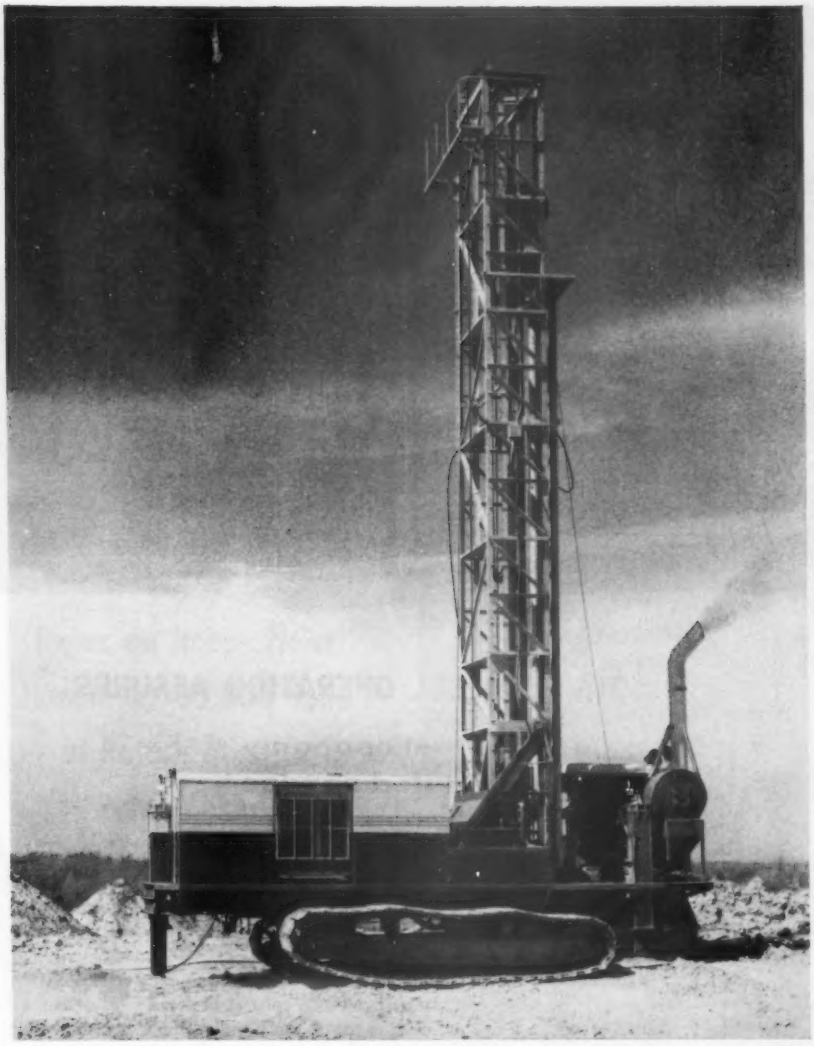
Your nearby Honeywell field engineer can give you complete details on how to apply this system to your own kiln. Call him today . . . he's as near as your phone. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

First in Control

SINCE 1885

75th YEAR PIONEERING THE FUTURE



ROTA-BLAST
RG-2JS
For extremely hard abrasive rock (Taconite, quartzite)

ROTA-BLAST
W7R
For hard rock (Siliceous limestone, dolomite, sandstone, granite)

ROTA-BLAST
OW
For medium rock (Limestone, sandstone, sandy shales)

ROTA-BLAST
OSC-1G
For soft formations (Calcite, shale, clay)

HUGHES "*Rota-Blast*" *Bits* are engineered for mining

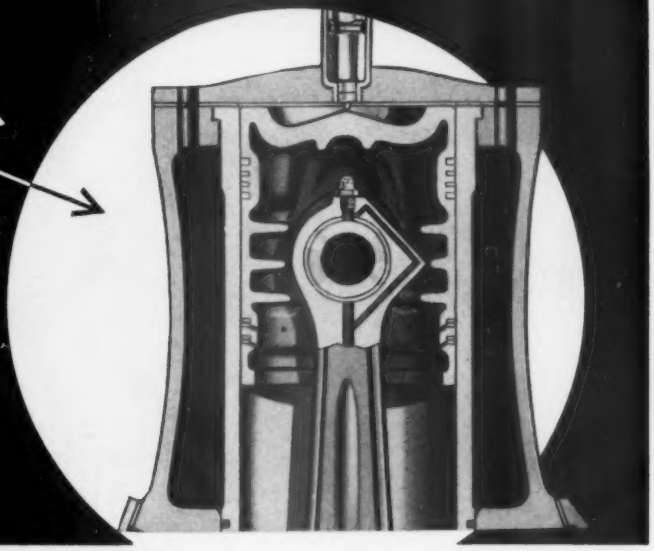
Hughes "Rota-Blast" RG-2JS rock bits and rotary drilling techniques, developed in close co-operation with operators and drill manufacturers, are increasing footage and penetration rate 100% and more in areas where blast hole drilling is the toughest.

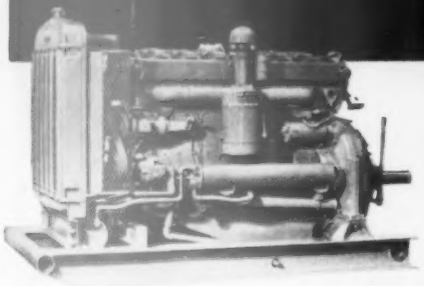
The engineering and research that developed the RG-2JS for hard formations goes into every size and type in Hughes complete line of "Rota-Blast" rock bits—each engineered specifically for most efficient rotary blast-hole drilling in the kind of formation for which it is designed.

Your Hughes representative can recommend the "Rota-Blast" bit best suited to your operation, and is also qualified to offer you assistance in your drilling program. Behind his recommendations and the bits he sells are the world's largest rock bit manufacturing plant and more than a half-century of specialized rotary rock bit experience.

HUGHES
industrial products
HUGHES TOOL COMPANY • HOUSTON, TEXAS

Another way you save money with a MURPHY DIESEL





"TRUE" DIESEL OPERATION ASSURES

greater fuel economy
uninterrupted service
faster starting
smoother performance

If you want to get more power from every drop of fuel, smooth-running performance, and long service life, be sure you get a "true" diesel.

Murphy Diesel is a "true" diesel. The cross section above shows the combustion chamber. Note that it is plain and open. There is no pre-mixing chamber, no artificial device to create turbulence and affect combustion. In a Murphy, the unit fuel injector, located in the center of the combustion chamber, sprays completely atomized fuel directly into all parts of the air charge. Since all the fuel burns immediately upon injection into the incandescent air charge, combustion is controlled solely by the unit injector, which in turn is precisely controlled by the hydraulic servo-type governor.

Ask your Murphy Diesel Dealer for proof of Murphy's ability to save you money.

427-RO

MORE MONEY-SAVING FEATURES

Unit Fuel Injectors serve as both pump and nozzle to provide precise control, faster response and greater fuel economy with minimum downtime, minimum attention.

Hydraulic Servo-Type Governor assures immediate response to load change and protects engine from damage if lube oil pressure drops below a safe level.

Four Valves Per Cylinder have greater breathing capacity for cooler running, and permit higher power output.

Murphy Diesel MP Series engines and power units, 105 to 320 HP; generator sets, 60 to 227 KW; dual fuel engines, 147 to 227 HP; marine engines, 105 to 315 HP.

MURPHY DIESEL ENGINE FEATURES MEAN MORE PROFITABLE OPERATION

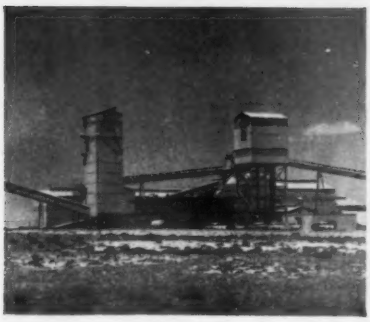
MURPHY DIESEL

MURPHY DIESEL COMPANY

5307 W. Burnham St. Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation



Ropes on Koepe Hoist Handle 2,400,000 Tons in Potash Mine in New Mexico

Serving for 26 months on a Koepe skip hoist at National Potash Company's mine, Carlsbad, New Mexico, Bethlehem Wire Rope handled approximately 2,400,000 tons of corrosive ore. The hoist cables were 1-in. 6 x 27 Form-Set Purple Strand, with fiber core; 1⅜-in. 19 x 19 Form-Set mild plow, non-rotating rope was used for the tail lines.

Economical service is something you can rely on when you specify Bethlehem Wire Rope. Put it to work and you can count on faithful rope performance, shift after shift.

BETHLEHEM WIRE ROPE

BETHLEHEM STEEL

BETHLEHEM STEEL

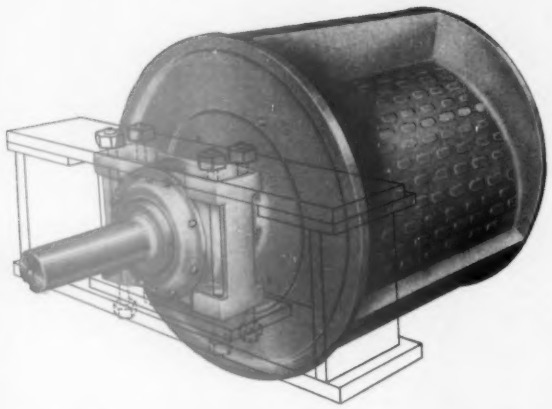
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

There's a distributor of Bethlehem Rope near you, supplied by our nationwide network of wire rope mill depots.

HIGH REDUCTION RATIOS with HIGH CAPACITY

KENNEDY DUAL-ROTOR IMPACT BREAKERS



This is the exclusive KENNEDY solid rotor of armor plate steel machined to perfect balance. Its entire face is hard surfaced. Manganese steel end discs prevent side wear and confine process material to the reduction area. A heat treated, alloy steel shaft is pressed and locked into the rotor core. Heavy duty, self-aligning, spherical roller bearings are rigidly attached to the heavy, box section base frame.

KENNEDY Impact Breakers are characterized by high capacities, high reduction ratios and a high proportion of cubical product at relatively modest initial and operating costs. Five convenient sizes are now available, from 30 x 48 to 60 x 72. These, plus the 36 x 30 single-rotor model, make up a line of machines with a size for every application.

KENNEDY Impact Breakers feature:

- primary and secondary reduction in one operation . . . because of their higher capacity, fewer machines are required.
- use of the principle of true, controlled, free impact . . . rock is shattered along the lines of natural cleavage.
- simple, inexpensive maintenance . . . truly effective use of wearing parts keeps output and product quality high.

Send for KENNEDY Bulletin 60-A describing the many features of KENNEDY's Dual-Rotor Impact Breakers, the most efficient and effective impact breakers built.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

Primary & Secondary Gyratory Crushers • Jaw Crushers • Roll Crushers • Impact Breakers • Hammer Mills • Rod & Ball Mills • Kilns & Kiln Accessories • Dryers • Scrubbers • Screens • Pneumatic & Mechanical Conveyors • Complete Crushing, Lime, Cement & Carbon Paste Plants. • Research & Testing Service.

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Naval Stores Department

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INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

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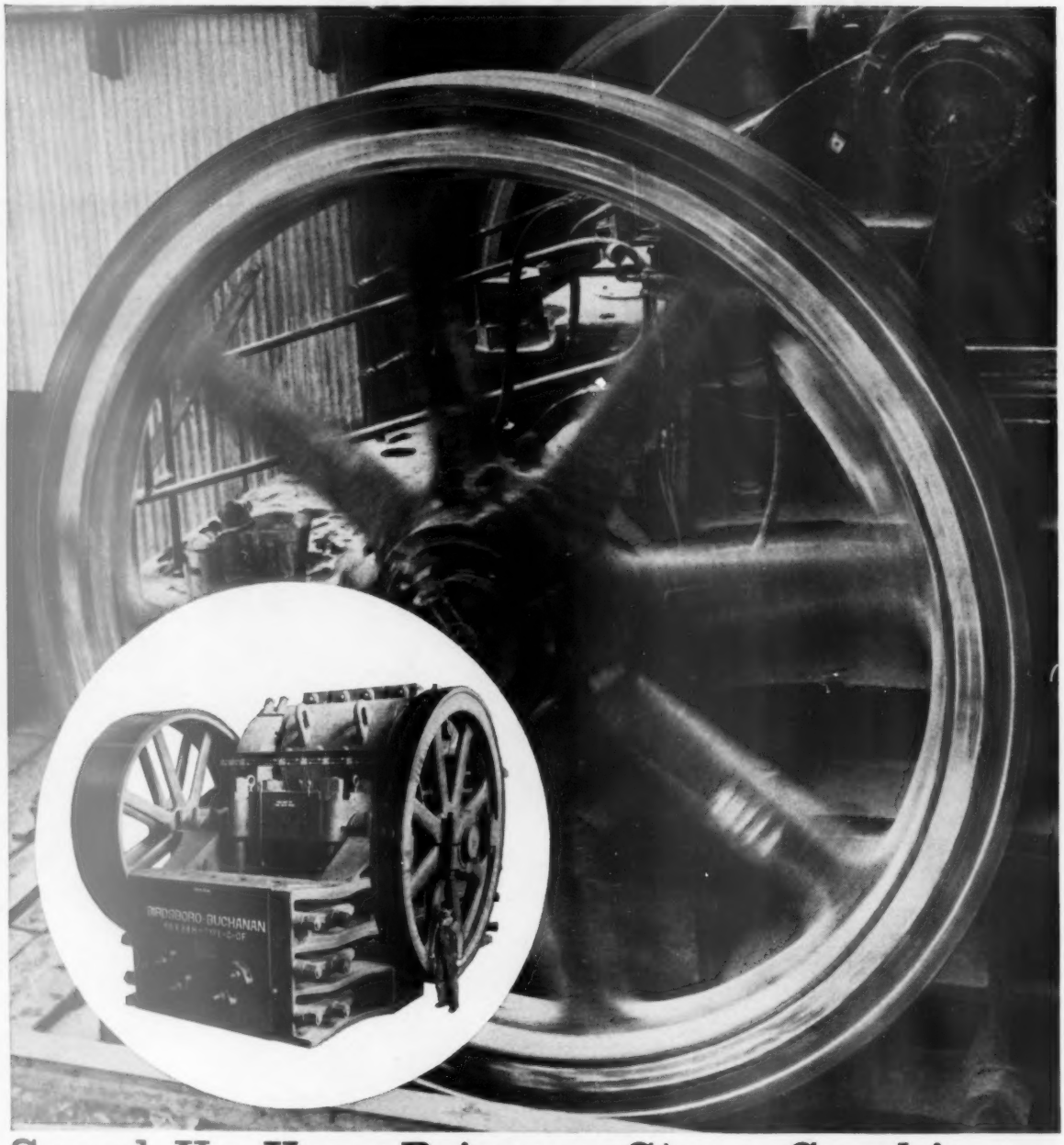

Speed Up Your Primary Stage Crushing...
with a BIRDSBORO-BUCHANAN deep-frame crusher

Almost any primary crushing operation will realize new production economies. Birdsboro's Deep-Frame design assures positive nipping action, minimizes slippage and gives higher rate of reduction. The longer swing jaw with more acute angle gives you faster crushing to small sizes. Full range of sizes to suit any plant design. A Birdsboro representative can supply all details plus proved performance data.

CR19-58R

Sales Department, Engineering Department and Mfg. Plant: Birdsboro, Pa., District Office: Pittsburgh, Pa. **Canadian Representative & Manufacturer: John Inglis Co., Ltd., Toronto, Canada.** World-Wide Agent Representation. Contact home office for nearest representative.

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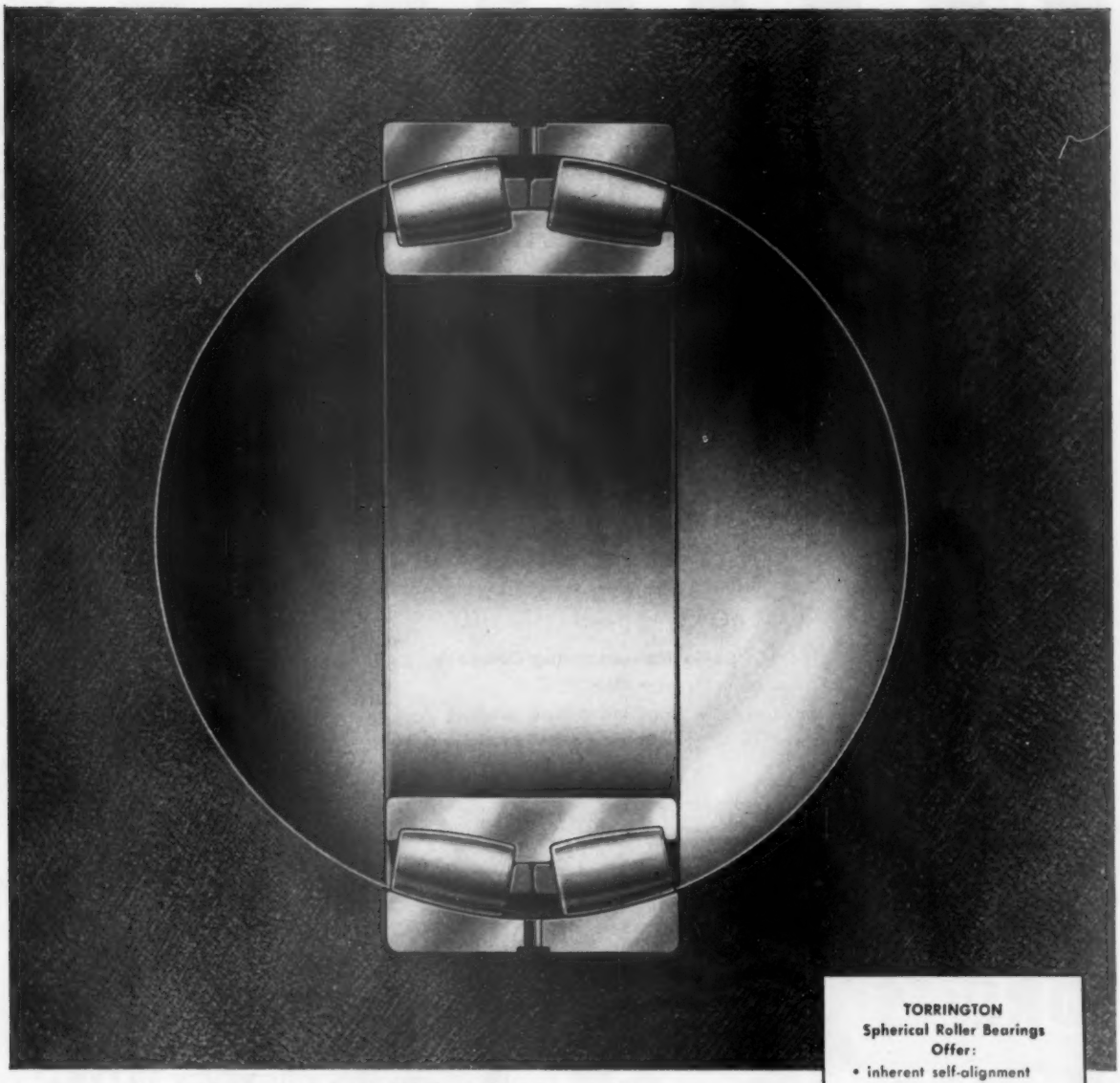
CORPORATION

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • ROLLS • ELECTRIC STEEL CASTINGS: Carbon, Low Alloy and STAINLESS STEEL



IN TORRINGTON SPHERICALS . . . NO COMPROMISE WITH QUALITY

The spherical design concept of Torrington Spherical Roller Bearings means superior performance and outstanding service life under the toughest operating conditions. It means inherent self-alignment, high radial and thrust load capacity, low friction. It allows compensation *within* the bearing for both dynamic and static misalignment.

Roller guidance is positive and accurate . . . is assured by grinding roller ends and center guide flange surfaces to a common spherical radius. Results are truer rolling motion, minimum friction and higher degree of geometric stability. Bearing operation is cooler, quieter, smoother.

If you're looking for outstanding bearing performance and bearing *value*, you should specify Torrington Spherical Roller Bearings. Backed by Torrington's uncompromising experience in engineering and manufacturing every basic type of anti-friction bearing, their quality is unmatched.

TORRINGTON
Spherical Roller Bearings
Offer:

- inherent self-alignment
- conformity of rollers to raceways
- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- even load distribution
- long, dependable service life

send for new Torrington Spherical Roller Bearing Catalog #258

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY South Bend 21, Indiana • Torrington, Conn.

Merrick will unveil a completely new line of WEIGHTOMETERS® and FEEDOWEIGHTS® at the Power Show

You are cordially invited to see this continuous weighing and proportioning equipment.

BOOTH NO. 416
NEW YORK COLISEUM
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December 2, 1960

Merrick Scale Manufacturing Company
180 Autumn Street • Passaic, N. J.
More than fifty years of "firsts" in automatic weighing

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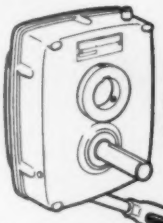
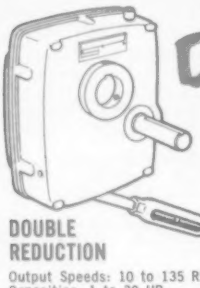
FOOTE BROS.
SHAFT MOUNTED DRIVES



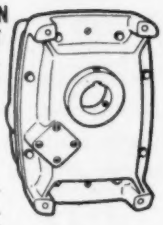
SINGLE REDUCTION
Output Speeds: 90 to 420 RPM
Capacities: ¼ to 40 HP

with
Duti-Rated LIFETIME GEARING



DOUBLE REDUCTION
Output Speeds: 10 to 135 RPM
Capacities: 1 to 30 HP

DOUBLE REDUCTION FLANGE MOUNT
Output Speeds: 10 to 135 RPM
Capacities: 1 to 7 HP



High hardness, premium quality Duti-Rated Lifetime Gearing in Foote Bros. Shaft Mounted Drives gives them greater load carrying capacity with long service life. Quick, easy installation on driven shafts with diameters from 15/16" to 3-7/16" saves time, labor, eliminates need for couplings and adjustable motor mount. Built-in backstop to prevent reverse rotation.

Write for Shaft Mounted Drive Catalog.

FOOTE BROS. GEAR AND MACHINE CORPORATION
4571 South Western Boulevard, Chicago 9, Illinois

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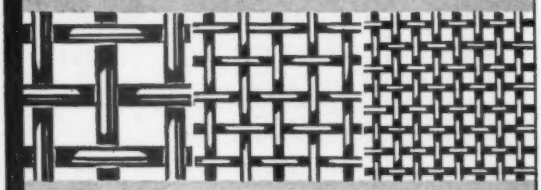
STRONG AS ARMOR
NAT-ALOY
Woven Wire Screens



Reliable Nat-Aloy woven wire cloth is specified throughout industry for maximum screening accuracy and economy. Available in flat surface, lock crimp, double crimp, rectangular and long slot openings. All sizes, meshes and gauges—prompt shipment.

WE OFFER NOW...SUPER NAT-ALOY
OIL TEMPERED WOVEN WIRE CLOTH
★ GREATER RESISTANCE TO ABRASION
★ MORE TONNAGE AT LOWER COST
★ FEWER COSTLY CHANGE OVERS

Write for information. Also stainless steel wire screens.

NATIONAL WIRE CLOTH COMPANY
252 W. Fairfield Ave., St. Paul 1, Minnesota

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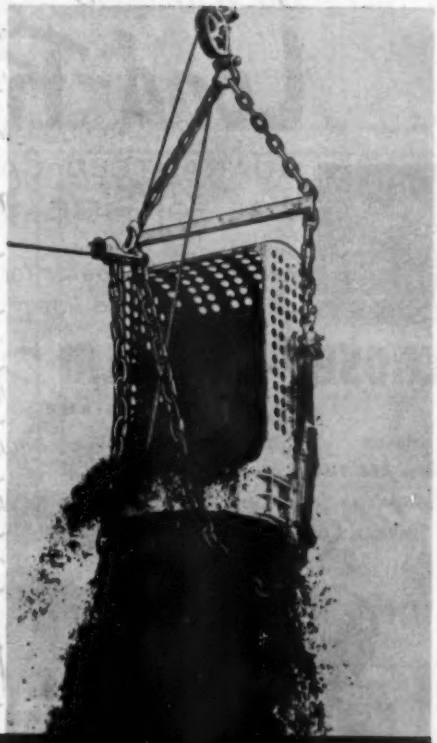
YARDS
~~DAYS~~ AHEAD OF SCHEDULE!



HENDRIX DRAGLINE BUCKETS

Fill Faster

Handle Easier

Dump Cleaner

"A Type for Every Digging Purpose"

¼ to 40 Cubic Yards

Hendrix Lightweight DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

ONLY CROSBY-LAUGHLIN SHACKLES

SAY WHAT THEY DO
DO WHAT THEY SAY!

Load-Rated®

GUARANTEED CAPACITIES
SIZE FOR SIZE—UNEQUALLED!

Ask your distributor for catalog on the complete line

CROSBY-LAUGHLIN *Division*

FT. WAYNE, INDIANA

Forged fittings for wire rope and chain

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Winslow **TRUCK SCALES**
PIT AND PITLESS TYPES

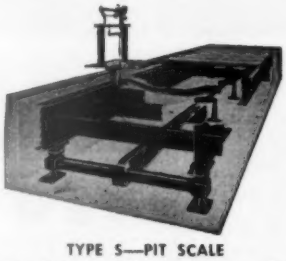
CABINET DIAL

Weight indication available includes ball bearing poise weighbeams, direct reading and weight imprinting types, and dial equipment with or without weight printer.

Write or phone for more information
PHONE NORTH 1231

TYPE CS—PORTABLE—PITLESS

Type CS scales, pitless installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 70 tons. Platform sizes 18′ x 9′ thru 50′ x 10′, wood or steel deck.



TYPE S—PIT SCALE

Type S scales, pit installations, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 60 tons. Platform sizes 22′ x 9′ thru 60′ x 10′ for wood or concrete decks.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.

4830 NORTH 25TH ST. TERRE HAUTE, IND.

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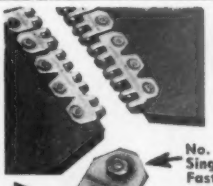
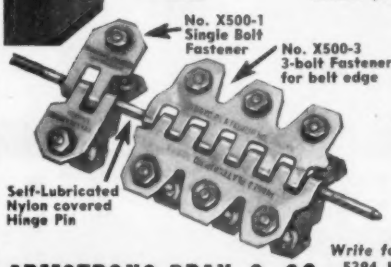


New **HINGED PLATEGRIP**

Recommended for mines, quarries, construction work, storage yards—wherever belt length must be frequently changed. Hinged Plategrip Fasteners make a strong, flexible joint in heavy duty conveyor belts, trough naturally, ride smoothly over pulleys, yet can be separated by simply pulling the hinge pin. *Improved* design takes the new smaller diameter self-lubricating nylon sheathed cable hinge pins. No. X500-1 single bolt fasteners and No. X500-3 3 bolt fasteners (used at outside edges) to reinforce edges and aid troughing.



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ARMSTRONG-BRAY & CO. 5394 NORTHWEST HIGHWAY CHICAGO, ILLINOIS

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DEPENDABLE
FOR 60 YEARS

Woven Wire
ALLOY
SCREENS

TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

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Write for rate card.

Closing date:

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Used equipment, employment and professional ads only are eligible for classified advertising rates.

PIT & QUARRY
431 S. Dearborn St. Chicago 5, Ill.

November 1960

BROADCAST

Section

AIR SEPARATOR WANTED

Wanted 5', 6', & 8' mechanical air separator, Gayco, Sturtevant or Raymond type. In reply state make, age, model, type of bearings, with or without liners and price to

Box No. PQ-3115-M, c/o Pit and Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

WANTED

Quarry Superintendent for small eastern quarry. Good Future. Small starting salary.

Box No. PQ-390-J, c/o Pit & Quarry Publications
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ENGINEER WANTED

Splendid opportunity with fast-growing company, for man capable of handling design of Aggregate Plant equipment and components. Give full details of education, experience, age, starting salary required, etc., in first letter. Personal interview will be arranged for qualified applicants. Replies strictly confidential.

Box No. PQ-3112-M, c/o Pit and Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

WANTED

General Superintendent

For Stone Quarry and Black Top Plant. Must be experienced and under 45 years old—to supervise 18 men operating quarry, plant and maintenance of equipment. Salary & % for one who can show results. In central New York State.

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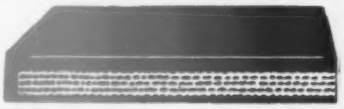

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Width	Ply	U.S. Made Per Foot
14"	4	$2.94
16"	4	3.09
18"	4	3.42
20"	4	3.95
24"	4	4.43
30"	4	5.42
36"	4	6.43

MAJOR C-BEE BRAND: SMOOTH SURFACE: 15# to 17# Friction Pull. 1600# to 2300# Cover Tensile. 28 oz. duck. Skim coat between plies. Heavy Duty belt for severe service and abrasion resistance.

Width	Ply	Top Cover	Bottom Cover	Imported Per Foot
16"	4	1/8"	1/32"	$3.12
18"	4	1/8"	1/32"	3.44
20"	4	1/8"	1/32"	3.97
24"	4	1/8"	1/32"	4.46
30"	4	1/8"	1/32"	5.56
36"	4	1/8"	1/32"	6.45
The Following Belts Are 32 Oz. Duck, 5 Ply:				
24"	5	1/8"	1/16"	$4.53
30"	5	1/8"	1/16"	5.60
36"	5	3/16"	1/16"	7.18

MAJOR BEE BRAND: 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty 28 oz. duck, 1/8" top x 1/32" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

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16"	4	$3.60	$3.14
18"	4	3.98	3.47
20"	4	4.54	3.99
24"	4	5.14	4.50
30"	4	6.31	5.58
24"	5	5.10	4.73

Other widths, plies, duck weights and cover thickness available at low prices.

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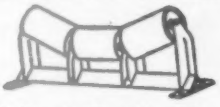

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14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	$ 8.50	24" belt	$11.00
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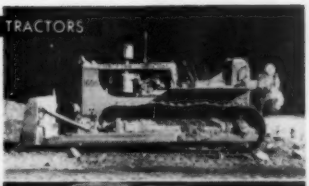

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15—Model D9 Caterpillar Tractors w/P.C.U.'s and Dozers, 18A Series (Note: 4—Ateco Hydraulic Rippers available for above); 21—Model D8 Caterpillar Tractors w/P.C.U.'s and Dozers, 14A Series (Note: 6—Caterpillar #8 Hydraulic Rippers available for above).

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1—3400 gal. Model CF523C6 Kenworth powered by Model NRT6B1 Cummins Engine; 1—3400 gal. Model R1F402 International powered by Model NHB Cummins Engine; 1—3600 gal. Model RDF192A International powered by Model JBS600 Cummins Engine; 2—6000 gal. Model 46TD Euclid powered by Model NHRBIS Cummins Engine.

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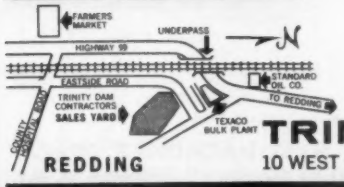

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Euclid 49 FD 6753 (leased)	15-tons	Indianapolis, Ind.	1947
Euclid 49 FD 7431 (leased)	15-tons	Indianapolis, Ind.	1948
Euclid 2 FD 2785	15-tons	Indianapolis, Indiana	
Euclid 2 FD 2965	15-tons	Indianapolis, Indiana	
Euclid 5 FD 1288	15-tons	Indianapolis, Indiana	
Euclid 5 FD 1521	15-tons	Indianapolis, Indiana	
Euclid 27 FD 3438	15-tons	Indianapolis, Indiana	
Euclid 20 TD 10583	22½-tons	Boise, Idaho	1950
Euclid 20 TD 10591	22½-tons	Boise, Idaho	1950
Euclid 20 TD 10830	22½-tons	Boise, Idaho	1950
Euclid 20 TD 10837	22½-tons	Boise, Idaho	1950
Euclid 20 TD 10581	22½-tons	Boise, Idaho	1950
Euclid 32 TD 11475	22½-tons	Boise, Idaho	1951
Euclid 20 TD 10582	22½-tons	Coeur d' Alene, Idaho	1950
Euclid 20 TD 10836	22½-tons	Coeur d' Alene, Idaho	1950
Euclid 63 TD 21201	22½-tons	Dutch John, Utah	1957
Euclid 63 TD 21708	22½-tons	Dutch John, Utah	1957
Euclid 63 TD 21709	22½-tons	Dutch John, Utah	1957
Euclid 36 TD 15149	10-ton Underground	Hibbing, Minnesota	1952
Dart 10SUG57038	10-ton Underground	Indianapolis, Indiana	1957
Dart 10SUG57052	10-ton Underground	Indianapolis, Indiana	1957
Mack LRIS 1159D	15-tons	Indianapolis, Indiana	1950
Mack LRIS 1053D	15-tons	Indianapolis, Indiana	1949
Mack LRV2D 1242D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1243D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1244D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1245D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1247D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1248D	34-tons	Hibbing, Minnesota	1952
Mack LRV2D 1287D	34-tons	Hibbing, Minnesota	1953
Mack LRV2D 1297D	34-tons	Hibbing, Minnesota	1953
Mack LRV2D 1343D	34-tons	Hibbing, Minnesota	1954
Mack LRV2D 1342D	34-tons	Hibbing, Minnesota	1954
Mack LRV2D 1344D	34-tons	Hibbing, Minnesota	1954
Mack LRV2D 1345D	34-tons	Hibbing, Minnesota	1954
Mack LRV2D 1341D	34-tons	Hibbing, Minnesota	1954
Mack LRV2D 1302D	34-tons	Hibbing, Minnesota	1953
Mack LV1D 1014D	22½-tons	Indianapolis, Indiana	1953
Mack LR2D 1089	30-tons	Hibbing, Minnesota	1954
Mack LR2D 1046	30-tons	Hibbing, Minnesota	1954
Mack LR2D 1203	30-tons	Hibbing, Minnesota	1954
Mack LR2D 1091	30-tons	Hibbing, Minnesota	1954

1 Northwest 80D comb. shovel, dragline & crane—Ser. #18501—Salt Lake City, Utah, 1957

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1—Penn. Super-Thor Hammermill, size SXT-13, 250 H.P.
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Hardinge Conical Ball Mill, 36" x 8" Air Swept; complete

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Crushers, Conveyors, Screens, Pumps, Elevators, Supporting Structures (Steel), Bins, Sand Dewatering Equipment, Whirlcone, Equipped with Electric Motors, Switches, Etc.

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120TM Hopto
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Amer. #38-S rolling ring crusher
Wms. 36 x 24 hammermill, 50 HP
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Farrel Lab. Jaw Crusher 6" x 2"
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Pennsylvania Hammermill 30 x 24, M-2
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4'6" x 16" 6' x 36", 8' x 36", and 10' x 48"

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4' x 11' Ruth with Drive
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4'-0" Traylor Type TY
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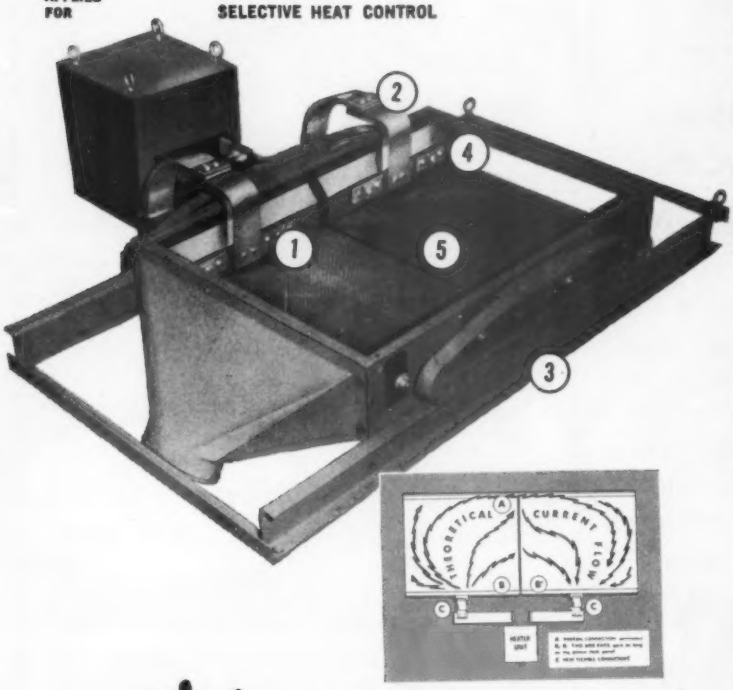

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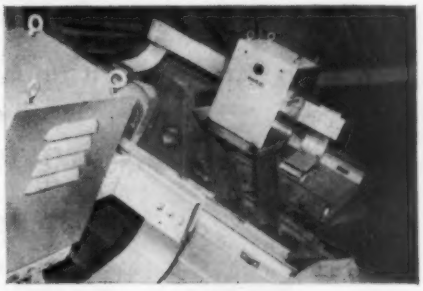

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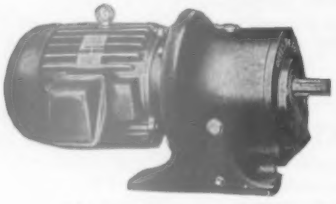

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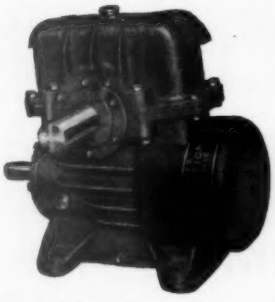

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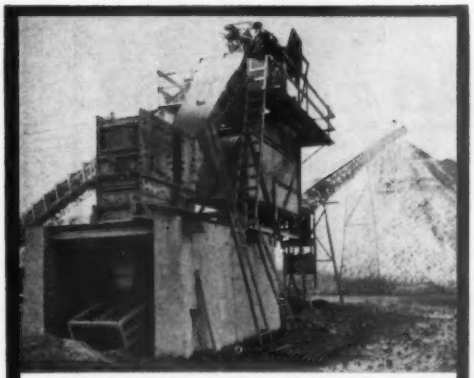

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Air-controlled Lima 1250 speeds rock loading

If you want to move more rock faster, easier and more profitably—Lima's the shovel for you!

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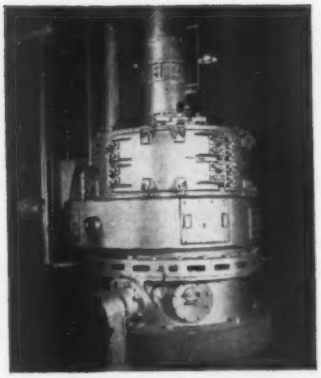

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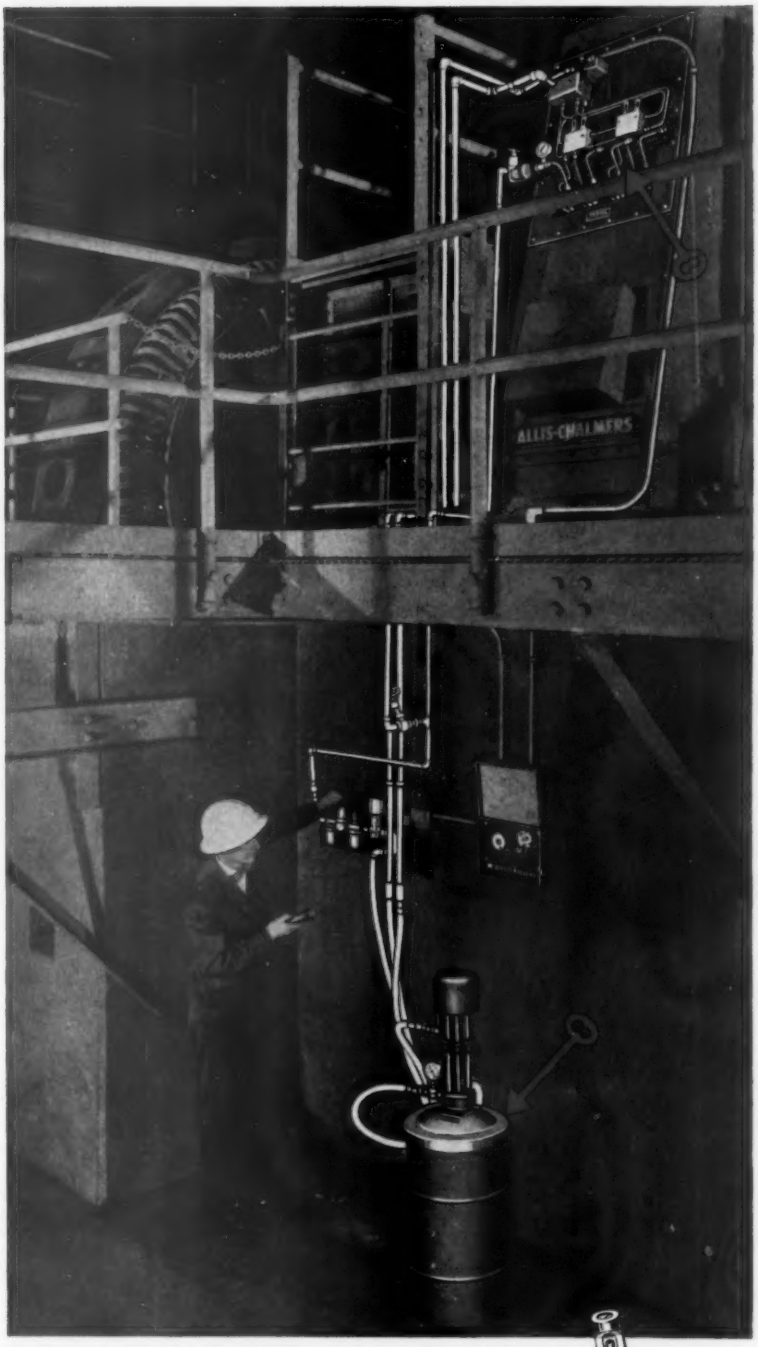

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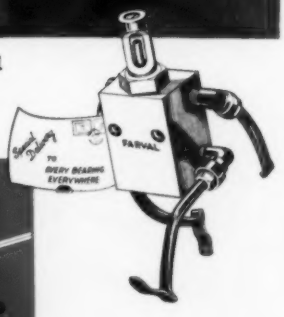

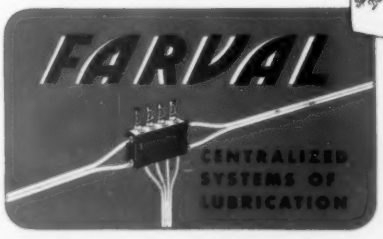

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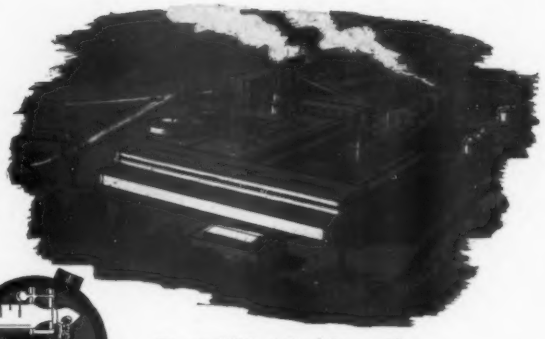
. . . and the best in open mouth bag filling machines is The Kraftpacker, for which we are exclusive sales agents.



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